U.S. Fish Wildl. Serv.
Commer. Fish. Abstr.

VOL. 23 No. 3

COMMERCIAL FISHERIES ABSTRACTS

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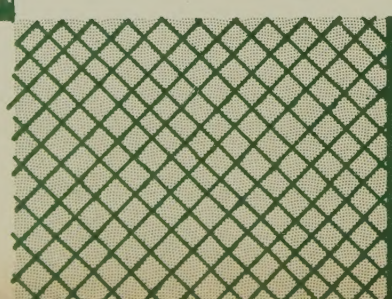

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FOREWORD

The Department of the Interior's Bureau of Commercial Fisheries publishes the monthly journal Commercial Fisheries Abstracts as one means of communicating to the fishing industry and allied groups the status of current fishery research. The research includes the biological aspects of fishery science as well as technological studies dealing with aquatic resource supply, harvesting, processing, utilization, and distribution.

Commercial Fisheries Abstracts contains summaries of selected articles from trade, engineering, and scientific journals dealing with the entire spectrum of fishery science. The publication is designed to serve the needs of fishery scientists, engineers, and managers in industry, academic institutions, and government by supplying timely information on current progress in fishery research and technology.

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A description of the numbering system is contained in FISHERY LEAFLET No. 232: "FISHERY TECHNOLOGICAL ABSTRACT CARD SYSTEM," by Maurice E. Stansby, K. L. Osterhaug, and F. Bruce Sanford. The Leaflet is obtainable free from this Bureau.

Use of trade names in abstracts does not imply endorsement of commercial products.

0.33 (1.12) FORMATION OF A GREEN PIGMENT FROM TUNA MYOGLOBINS

Grosjean, Ok-Koo, Bryant F. Cobb III, Bruce Mebine, and W. Duane Brown (Institute of Marine Resources, Department of Nutritional Sciences, University of California, Berkeley 94720)
Journal of Food Science 34, No. 5, 404-407 (September-October 1969)

A green off-color reaction has been encountered in cooked tuna (albacore, bigeye, bluefin, yellowfin, and skipjack). The purpose of this study was to explore the roles of myoglobin, trimethylamine oxide (TMAO), amino acids, mercapto compounds, and oxidizing and reducing agents in this greening reaction.

A green pigment was produced when tuna myoglobins, TMAO, and cysteine were heated together in 0.1 M phosphate buffer at pH 5.7. The green color could not be produced with mammalian myoglobins (which contain no cysteine residues). Myoglobin must be denatured (apparently exposing a sulfhydryl group) for the greening reaction to occur. TMAO served as a mild oxidizing agent in promoting the formation of a disulfide bond between cysteine and the sulfhydryl group on the denatured myoglobin. Oxygen (from the air) could replace TMAO, but cysteine appeared to be specific for the reaction. The green color could be reversed by sodium sulfite, but not by certain other reducing agents tested.

The development of green color appears to involve the reaction of free cysteine with the -SH group of the heat denatured tuna myoglobin under mild oxidizing conditions to produce a disulfide bond and trimethylamine, with possibly a catalytic influence by the iron (Fe+++) of metmyoglobin. The reaction is summarized as follows:

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 Abstracter: F. T. Piskur

0.36 THE REACTION OF BENZOQUINONE WITH AMINES AND PROTEINS

Morrison, Martin, Wilbert Steele, and Dean J. Danner (Departments of Biochemistry, St. Jude Chicldren's Research Hospital, Memphis, Tennessee 38101 and the City of Hope Medical Center, Duarte, California 91010)
Archives of Biochemistry and Biophysics 134, No. 2, 515-523 (November 1969)

A great variety of quinones occur in nature, and they may play a role in metabolic systems. Most previous studies have stressed the ability of quinones to serve as redox couples in biological oxidation systems. The present paper reports on a study of the reaction of benzoquinone with amines, amino acids, and proteins.

The authors showed that benzoquinone will form 1,4 addition products with amines, amino acids, and proteins. The substituted quinones produced by way of this reaction have altered redox potentials. The quinone amino adduct can be reduced by ascorbate and oxidized by oxygen to produce hydrogen peroxide, and the sequence of reactions can be monitored by following the oxygen consumption in the presence of excess ascorbate. All the amino acids seemed to react with the benzoquinone in the same manner independent of their side chains. Both monosubstituted and disubstituted benzoquinone amine products were formed. Proteins reacted with benzoquinone in a manner similar to that for the simple amino acids. Cytochrome c reacted readily with benzoquinone to form a product containing two to four moles of benzoquinone per mole of cytochrome c. The position of benzoquinone in the product was such that it was not accessible to the heme groups and did not cause

(over)

 Abstracter: F. T. Piskur

1.82 THE GENERAL DISTRIBUTION OF THE SURF CLAM AND OCEAN QUAHOG

Merrill, Arthur S., and John W. Ropes (U.S. Bureau of Commercial Fisheries Biological Laboratory, Oxford, Maryland)
Proceedings of the National Shellfisheries Association 59, 40-45 (June 1969)

Commercial quantities of surf clam (Spisula sp.) and ocean quahog (Arctica islandica) are known to exist along the east coast of the United States. Of six species of shellfish landed between 1961 and 1965, the average annual landings of surf clams ranked second only to those of oysters, whereas those of ocean quahogs ranked last. However, recently developed consumer products should stimulate the quahog fishery. To help the industry make objective decisions about developing this fishery, the authors charted the distribution of ocean quahogs and the largest species of surf clams, S. solidissima (some shells are as much as 200 mm. long), from Cape Hatteras to Nova Scotia).

Both species were found to be concentrated along the Continental Shelf of the Middle Atlantic Bight. Most surf clams inhabit waters to depths of 43 m., the average depths being 29 m. Most ocean quahogs inhabit waters ranging in depth from 25 to 61 m., the average being 42 m. Both species inhabit deeper water at the southern end of their range than at the northern end. The shallow water and near-shore habitat of the surf clams is an obvious factor in the success of the fishery. However, the widespread distribution of the quahogs, coupled with use of sea-processing techniques and of the technology developed by the surf clam

(over)

 Abstracter: L. Baldwin

2.02 (9.19) METABOLISM OF ORGANOPHOSPHORUS INSECTICIDES BY LIVER HOMOGENATES FROM DIFFERENT SPECIES

Rao, S. L. N., and W. P. McKinley (Research Laboratories, Food and Drug Directorate, Department of National Health and Welfare, Ottawa, Canada)
Canadian Journal of Biochemistry 47, No. 12, 1155-1159 (December 1969)

The authors studied (1) the rates of disappearance of parathion, diazinon, ethion, phorate, Di-Syston (disulfoton), methylparathion, Guthion (azinphosmethyl), and ronnel effected by a hepatic oxidative desulfurating system of four different species (rat, guinea pig, chicken, and monkey) in the presence of NAD (nicotinamide-adenine dinucleotide) and NADP (nicotineamide-adenine dinucleotide phosphate) and (2) the rates of disappearance of methylparathion, Guthion, and ronnel effected by the demethylating system in the presence of reduced glutathione.

They found that the rates of disappearance of phorate and Di-Syston were considerably higher than the rates for the other compounds with all the liver homogenates studied except female chicken liver. Methylparathion, Guthion, and ronnel were metabolized by the oxidative desulfurating system and the demethylating system, but the latter system was the more active for the three compounds. The rates of disappearance of the various insecticides effected by the oxidative system were considerably less when inoculated with livers from female chickens than with livers from male chickens. Such differences were not found in the

(over)

 Abstracter: F. T. Piskur

1.21 SYNOPSIS OF BIOLOGICAL DATA ON THE ANCHOVETA CENTENGRAULIS MYSTICETUS GÜNTHER, 1866

Bayliff, W. H. (Scripps Institution of Oceanography, La Jolla, California)
FAO Fisheries Synopsis No. 43, 49 pp. (October 1969) (Food and Agriculture Organization of the United Nations, Rome, Italy) (Distribution restricted)

Among the sections in this synopsis are one on exploitation--dealing with fishing equipment (gears and boats), fishing areas (general geographical distribution, geographic ranges, depth ranges, and conditions of the grounds), and fishing operations and results (effort and intensity, selectivity, and catches)--and one on protection and management--dealing with regulatory measures (limitation or reduction of the total catch and protection of portions of the population), control or alteration of physical features of the environment, control or alteration of chemical and/or biological features of the environment, and artificial stocking. [7 figures, 13 tables, 89 references] [Abstracter: L. Baldwin]

1.82

industry, should offset the problems posed by fishermen's having to fish at greater depths and distances from port. The authors suggest that extending the clam fishery to include ocean quahogs, a currently underutilized resource, would keep the shellfish industry from having to depend entirely on surf clams to fill the market demand for clam meats.
[3 figures, 2 tables, 19 references]

2.03 ASEPTIC AUTOLYSIS OF MACKEREL MUSCLE

Manita, Hideaki, Chiaki Koizumi, and Junsaku Nonaka (Tokyo University of Fisheries, Konan-4, Minato-ku, Tokyo, Japan)
Bulletin of the Japanese Society of Scientific Fisheries 35, No. 10, 1027-1033 (October 1969) (In Japanese; figures, tables, and summary in English)

In this work, the authors studied the course of the autolysis of mackerel muscle homogenate under strictly aseptic conditions with and without the use of an antiseptic on the fish muscle. They found: (1) the autolysis of the mackerel muscle homogenate proceeded readily at 45° C. at pH 3.5, and at 60° to 65° C. at slightly alkaline pH, (2) addition of antiseptics, such as toluene, chloroform, and thymol did not alter the optimum pH value (3.5) for autolysis at 45° C. but did lower considerably the rate of autolysis, and (3) the antiseptics inhibited the development of the brown discoloration and fat oxidation of the mackerel muscle homogenate during the autolysis.
[9 figures, 1 table, 22 references] [Abstracter: F. T. Piskur]

2.02

dehydlating system. Liver homogenates from the rat, the guinea pig, and the monkey were uniformly active in metabolizing the various insecticides by the oxidative system. Such data, plus other data that may be collected in the future, on the comparative rates of degradation of a variety of insecticides by liver homogenates of different species should be useful in selecting the most sensitive test animal for studying the toxicity of newly developed insecticides.
[3 tables, 21 references]

0.39 (0.6) SELECTIVITY IN FLAVOR MODIFICATION BY 5′-RIBONUCLEOTIDES

Woskow, Morris H. (Department of Food Science and Technology, University of California, Davis 95616)
Food Technology 23, No. 11, 32, 37 (November 1969)

Previous researchers have shown that 5′-disodium inosinate and 5′-disodium guanylate favorably influence preference judgments about fish, fowl, and certain canned vegetables. It is not clear, however, whether the ribonucleotides enhance the desirable flavors or whether they suppress the undesirable flavors. The purpose of the present study was to establish the specific mode of action on flavor of a 50:50 mixture of 5′-disodium inosinate and 5′-disodium guanylate. A taste panel of 11 judges was used in these tests. Apparently, the mixture enhanced sweetness and perhaps saltiness. It suppressed bitterness and sourness.
[1 table, 4 references] [Abstracter: F. T. Piskur]

0.33

$$\text{Native metmyoglobin} \xrightarrow{70^\circ\ \text{C.}} \text{Denatured metmyoglobin-SH}$$

$$\text{Denatured metmyoglobin-SH} + \text{R-SH} + [\text{O}] \xrightarrow{Fe^{+++}} \text{Denatured metmyoglobin-S-S-R} + H_2O$$

Apparently, the cysteine molecule (attached via the disulfide bond) is close to the porphyrin ring on the metmyoglobin and interacts to produce a change in the light-absorbing properties of the porphyrin group.
[6 table, 23 references]

0.34 (7.83) ORIGIN AND NATURE OF AROMA IN FAT OF COOKED POULTRY

Pippen, E. L., E. P. Mecchi, and M. Nonaka (U.S. Department of Agriculture, R&D Division, ARS, Albany, California 94710)
Journal of Food Science 34, No. 5, 436-442 (September-October 1969)

The characteristic aroma that occurs in the fat of cooked poultry is not derived from the fat itself but comes from and is dependent upon the lean portions of the meat. Protein, amino acids, and probably sugars and other water-soluble components are involved in aroma formation. Therefore, fat contributes indirectly and passively to the aroma of cooked poultry through its ability to dissolve and retain aroma components during the cooking process.
[7 figures, 7 tables, 31 references] [Abstracter: F. T. Piskur]

0.36

denaturation or alteration of the structure of the cytochrome c. Other proteins vary in their ability to form the quinone adduct, but all of them form adducts that are capable of catalyzing ascorbate oxidation. The authors suggest that the quinone adducts of the type described in this study may be important in biological systems. [4 figures, 3 tables, 31 references]

2.9 MECHANISMS OF TOXICITY
(9.19)

Aldridge, W. N. (ed.)
British Medical Bulletin 25, No. 3, 312 pp. (September 1969) 40s. (publisher)
Alistair Worden (reviewer)
New Scientist 44, No. 676, 423 (November 20, 1969)

The discovery of compounds whose toxic or carcinogenic action may become manifest only months or even years after a single exposure has blurred the distinction between acute and cumulative toxicity, once assumed to be clear cut. Prevention of such action is not too difficult. But every toxic molecule with a systemic effect after absorption challenges the experimental pathologist, who, strictly speaking, provides only the starting point for an interdisciplinary approach to basic studies on the effect of the chemical constituents of the environment on all that live in it. Among the papers treating this subject here are those dealing with the reversible binding of toxic compounds to macromolecules (by M. K. Rose); the delayed neurotoxic action of some organophosphorus compounds (by M. K. Johnson); the phosphorylation and carbamylation of esterases (by W. N. Aldridge); nitroso compounds (by Peter Magee and P. F. Swann); metabolism of toxic substances (by Dennis Parke and Tecwyn Williams); the mechanism of saxitoxin and tetrodoxin poisoning (by M. H. Evans); diet and toxicity (by André and Elizabeth McLean); and the toxic activities of microbes (by Harry Smith).

 Abstracter: L. Baldwin

2.1121 WORKING TIME OF DANISH SEINERS DURING ALASKA POLLACK FISHERY.
(1.55)(1.0142) I. THE OUTLINE OF WORK PATTERN
(1.0112)

Maéda, Hiroshi, and Shiro Minami (Shimonoseki University of Fisheries, Shimonoseki, Japan)
Bulletin of the Japanese Society of Scientific Fisheries 35, No. 10, 964-969 (October 1969)

This paper reports on the work patterns of 22 Danish seiners fishing for pollock in the Bering Sea during the 1964 fishing season. The fishing operations were carried out during daylight, which ranged from 15 to 18.6 hours during part of the season and was only about 12.4 hours during another part of the season. During periods when the catch was poor or when the hours of daylight were short, the fishing began shortly before daylight and continued shortly after sunset. The boats operated in the following time pattern: (1) laying the net--20.2 min., (2) sinking of the net and pulling the warp together--23.5 min., (3) hauling up the net and brailing the catch--59.4 min., and (5) miscellaneous work between succeeding hauls--17.8 min. [3 figures, 8 references]

II. Relation of Catch to Working Time. Ibid. 970-974.

This paper reports on the relation between the size of catch and the time patterns of work on Danish seiners fishing for pollock in the Berring Sea. The analysis showed:

1. The time to complete a haul (t_c) increased with the size of the catch (X) in accordance with the equation $t_c = 91.06 + 3.17X$, where t_c is expressed in minutes and X in tons.

(over)

 Abstracter: F. T. Piskur

2.1128 STUDIES ON THE FISHERY OF ZUWAI CRAB IN THE JAPAN SEA.
(1.86) (1.0154) VI. EFFICIENCY OF THE TOYAMA KAGO (A KIND OF CRAB TRAP) IN CAPTURING THE BENI-ZUWAI CRAB

Sinoda, Masatosi (Department of the Fish., Kyoto University, Maizuru, Japan) and Tosio Kobayasi
Bulletin of the Japanese Society of Scientific Fisheries 35, No. 10, 948-956 (October 1969)

The catch of crabs in a trap may depend upon (1) the abundance of the crabs in the area being fished, (2) the state of feeding of the crabs, (3) the size of the trap, (4) the distance between traps, (5) the length of time the trap is fished, (6) the size of the mesh of the netting used in the trap, and (7) the efficiency of the bait. The present paper reports on the effect of three factors, (4), (5), and (6), on the catch of Beni-zuwai crab (Chionoecetes japonicus, Rathbun). Distance between traps, duration of fishing, and mesh size are the important factors considered in developing fishing regulations.

The greatest number of crabs per trap was obtained when the traps were spaced about 40 to 56 m. apart. In one test, the commercial catch per trap did not necessarily increase in direct proportion to the time the traps were left in the sea. The effect of certain of the variables was not apparent, because the design of the tests limited the analysis that could be made.
[8 figures, 3 tables, 6 references]

 Abstracter: F. T. Piskur

2.1129 NORWEGIAN HOLDING NET TESTED IN MAINE SARDINE FISHERY

Sherman, Kenneth (U.S. Bureau of Commercial Fisheries, Biological Laboratory, Boothbay Harbor, Maine 04575)
Commercial Fisheries Review 31, No. 12, 8-10 (December 1969)

Sardines (juvenile Atlantic herring, Clupea harengus harengus) with excessive amounts of food in their stomachs are not suitable for canning. In Maine, fishermen have traditionally used weirs and stop seines for catching sardines nearshore, and have had little difficulty in holding fish until they were sufficiently clear of food for canning. Since 1962, however, a purse seine fishery for sardines has grown rapidly. Purse seine fishermen, lacking the protection found in inshore waters, have been obliged to send their catches immediately to a cannery for processing. The incidence of fish that are unacceptable for canning because of a "feedy" fish condition is thereby increased; these fish are diverted for use as fish meal. Norwegian fishermen have solved a similar problem by designing a holding net for use in the open sea.

The Maine Sardine Council invited Captain Arne Gronningsaeter of Landfast, Norway, to demonstrate the use of the Norwegian holding net to the Maine sardine industry....

The model used in the sea trial was 35 meters (115 ft.) long, 9 meters (30 ft.) wide, and 8 meters (26 ft.) deep. The netting on the sides and bottom is knotless nylon with stretched mesh of 1-1/8 inches. It is designed to hold up to 100,000 pounds of live sardines. In practice, the fish are transferred to the holding net immediately after they are purse seined and towed at 1 to 1-1/2

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2.1121

2. The time required to complete a haul (t_h) increased with the size of the catch as follows:

$t_h = 47.73 + 3.16X$.

3. No clear relation existed between the size of the catch and the net-laying and sinking-pulling time.

4. The nets were hauled more frequently on days of moderate catches than on days of poor or high catches. [3 figures, 4 references]

[Abstracter: F. T. Piskur]

Bacteria that produce drag-reducing polymers were isolated from 11 hydrodynamic test facilities in the United States, Great Britain, and France. The bacteria appear to be ubiquitous in all fresh and ocean water. The polymers are probably extracellular polysaccharides and have been produced from bacteria that grow at cold, moderate, or high temperatures. Laboratory tests indicate that absence of suitable energy and carbon sources limit polymer production in natural waters. The author recommends that primary production of the polysaccharides by algae be prevented and that degradable organic matter be eliminated in order to minimize the potential sources of carbon utilized by bacteria which produce drag-reducing polymers. [3 figures, 2 tables, 14 references]

Kenis, Paul R. (Naval Undersea Research and Development Center, Pasadena, California 91107)
International Shipbuilding Progress 16, No. 183, 342-348 (November 1969)

2.119 (0.5) TURBULENT-FLOW DRAG REDUCTION BY POLYMERS FROM MARINE AND FRESH WATER BACTERIA

2.1129

knots to a protected area. There, the net is anchored and the fish are left until cleared of food.....

The fish (ranging in length from 213 mm to 247 mm) were sampled immediately after transfer to the holding net, and again at midnight just before they were pumped into the carrier.

The digestive tracts were examined in the laboratory. Contents of the stomach--including the pyloric, cardiac, and caecal sections--and intestine were examined under 25X to 600X magnification....The amount of food in the herring after they were held for 5 hours was considerably less than when they were seined (66% less in the cardiac stomach and no food in the intestine); food in the digestive tracts was also in the late stages of digestion when the experiment ended.

The sardines were in good condition at the conclusion of the experiment. No dead fish were observed in the holding net. By transferring the fish, the seiner was free to make an additional set, while enhancing the quality of the confined fish....[4 figures]

[Abstracter: F. T. Piskur]

This paper reports the results obtained in 1965 of five deep-water longline sets in depths of 1,830-2,830 m. off the British Columbia (Canada) coast between 50°31'-54°32' N. and 129°00'-134°35' W. A total of 85 fish (comprising five species) was caught. [1 figure, 1 table, 8 references]

Bourne, Neil, and M. A. Pope (Fisheries Research Board of Canada, Biological Station, Nanaimo, British Columbia)
Journal of the Fisheries Research Board of Canada 26, No. 9, 2527-2531 (September 1969)

2.12 (1.0113) DEEP-SEA LINE FISHING OFF BRITISH COLUMBIA

2.05 (0.5) IN VITRO HEMOLYTIC CHARACTERISTIC OF VIBRIO PARAHAEMOLYTICUS: ITS CLOSE CORRELATION WITH HUMAN PATHOGENICITY

Miyamoto, Yasushi, Teiji Kato, Yasushi Obara, Shoichi Akiyama, Kinjiro Takizawa, and Shiro Yamai (Department of Microbiology, Kanagawa Prefectural Public Health Laboratory, Yokohama, Japan)
Journal of Bacteriology 100, No. 2, 1147-1149 (November 1969)

The pathogenic halophile Vibrio parahaemolyticus is the causative agent of the most prevalent food poisoning in Japan. Apparently, the organism occurs in the sea of Southeast Asia, in the Central Pacific, in the coastal areas of the United States, and in the Baltic Sea. In the course of the authors' studies of the occurrence of the organism on mackerel, it seemed that during the summer season the number of fish carrying V. parahaemolyticus was too high when compared to the incidences of the disease.

The authors found that strains of V. parahaemolyticus isolated from human sources and grown on a blood medium (Medium used by Kato, unpublished.) exhibited hemolysis, whereas those strains isolated from the natural environment were nonhemolytic. When they used a medium devised by Wagatsuma, certain peculiarities arose associated with hemolysis. These are: (1) horse blood cannot be hemolyzed; (2) heat sterilization of the medium affects hemolysis; and (3) the concentration of NaCl affects hemolysis--if Wagatsuma's base medium containing less than 5 percent salt is used, the nonhemolytic strains will exhibit hemolysis. Among interested researchers in Japan, it was agreed that to distinguish the peculiar hemolysis of V. parahaemolyticus, human blood--rather than animal blood--should be used in the basal medium and that Wagatsuma's medium should be used to demonstrate the positive or negative hemolytic phenomenon.
[2 tables, 9 references] [Abstracter: F. T. Piskur]

2.12 (2.116) UNDERWATER TV

Anonymous
Optical Spectra 3, No. 6, 38 (November/December 1969)

A new kind of television system, invented by a professor in the electrical engineering department at the Polytechnic Institute of Brooklyn, transmits moving pictures over a much narrower bandwidth than standard systems use. For underwater use, the bandwidth is so greatly reduced that transmission cables can be eliminated altogether--the moving television pictures are sent up from the ocean floor to the surface by underwater sound waves.
[1 figure] [Abstracter: L. Baldwin]

[Abstracter: L. Baldwin]

This revision of a booklet first published in 1958 gives advice on short- and medium-term storage of lobsters to decrease deaths in transit, to improve condition at the time of marketing, and thus to increase profits. It includes sections dealing with parasites, refrigerated storage, lobster rearing, and the storage of other crustaceans.

Anonymous
Lobster Storage (1969 revised edition) (Published for the Department of Agriculture and Fisheries Scotland by Her Majesty's Stationery Office) 4s 6d.
H. J. Thomas (Marine Laboratory, Aberdeen, Scotland)
Fishing News, No. 2947, 11 (November 28, 1969)

2.40 (9.6) (1.87) LOBSTER STORING

2.115 RESISTANCE TESTS WITH MODELS OF TWO FISHING BOATS

Hell, Antz (Chalmers University of Technology, Department of Naval Architecture and Marine Engineering, Gothenburg, Sweden)
International Shipbuilding Progress 16, No. 183, 329-341 (November 1969)

Two fishing-boat models were tested at different drafts to compare their resistance qualities. One was an 83-foot traditional Swedish wooden trawler (FS019); the other was an 85-foot stern trawler designed from FAO/NPL (Food and Agriculture Organization of the United Nations/National Physics Laboratory, England) optimized hull-form parameters (FS018). The FAO has transformed a large number of resistance data on fishing vessels of the world to a basic model length of 16 feet, and a regression equation is available by which resistance data expressed as C_{R16} can be calculated. C_{R16} is the resistance coefficient of a 16-foot model. Using this coefficient, the resistance of vessels of different displacement can be compared to the basis of resistance per ton of displacement at the same speed length ratio. This method was used to compare the hull forms of model FS018 and FS019 with existing ones.

The results indicated that the Swedish wooden trawler (FS019) was inferior from a resistance point of view. Also, the optimized form gave good results and gave a good correlation between model experiments and theoretical calculations. [28 figures, 1 table, appendix, 3 references]

 Abstracter: F. T. Piskur

2.146 FISH FINDING WITH SONAR
PART ONE -- THE EQUIPMENT

Anonymous
World Fishing 18, No. 10, 26-28 (October 1969)

Strictly speaking, the term sonar can be applied to all equipment that uses sound to indicate the presence, location, and nature of objects in the sea. However, in commercial fishing practice it is used to distinguish between the echo sounder, which directs a beam of sound more or less vertically through the water, and the acoustic system that can search around the vessel as well as up and down. Because of this extra dimension, a typical sonar, for instance, can scan ahead of the vessel in a semicircle nearly 5,000 yards in diameter, searching through 1,000,000,000 cubic yards of water in 2 min.

The sonar is similar to the echo sounder in that it consists basically of a transmitter, a receiver, and a transducer; the through-hull unit, however, is more complicated than that of the conventional echo sounder. The through-hull unit of the sonar described here consists of a raise/lower unit, which contains the motor and switching relays for raising and lowering the transducer (a green lamp for the transducer-up position and a red lamp for the transducer-down position show on the control cabinet when the equipment is switched on); a train/tilt unit, which contains a motor for training the transducer and a motor for tilting it (direction of the transducer and its angle of tilt are shown by indicators on the control cabinet); and the transducer itself. The transducer weighs 60 lb. and

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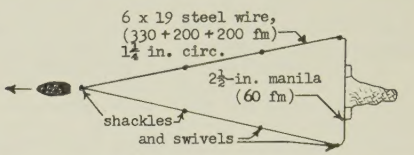
 Abstracter: L. Baldwin

2.147 THE USE OF WIRE ROPES FOR FLY-DRAGGING
(2.112)

Hatfield, M., and J. Robertson (Industrial Development Unit, British White Fish Authority)
Fishing News, No. 2947, 6-7 (November 28, 1969)

To bring about better working conditions for crews on fishing vessels and to reduce--or postpone--increases in the costs of catching fish, the British White Fish Authority (WFA) has tested a means of eliminating the laborious task of stacking seine ropes. The method involves bottom seining with continuous wire ropes that are wound onto drums or a trawl winch, rather than with coils of fiber cordage. The operation is something between trawling and seining, the steel wires used providing sufficient lateral drag to keep the net open for short tows of from 20 to 25 minutes; during this time, most of the fish in the area will have been caught.

The wire-rope triangle formed when the net is shot is illustrated (not to scale) to the right. Elapsed time for each step in the fishing operation is tabulated in the article. When 530 fathoms of wire was used at 75-fathom depths on a soft mud bottom (towing speed about 2 knots), the cod end was aboard and emptied in 64 minutes. Catch rates during the trials were equivalent to those of nearby vessels using five or six coils of manila per side.



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 Abstracter: L. Baldwin

2.1471 TRAWLING WITH NETZSONDE
(2.116)

Anonymous
World Fishing 18, No. 10, 36-37 (October 1969)

One-boat midwater trawling was developed to improve herring fishing by the German deep-sea fleet. Once operation with trawls and netzsonde had been made reliable, all German deep-sea trawlers were equipped for this kind of fishing. Moreover, it was extended to the cod, redfish, coalfish, and other fisheries. In addition to opening up new fishing grounds, it has increased the catch rates significantly--in 1965, the herring fishery yielded 16.6 tons per day; in 1966, it yielded 20.4 tons per day; and in 1967, 28.9 tons per day. The specially designed pelagic trawl used for this kind of fishing is described, with illustrations, and the effects of midwater trawling on the design of fishing vessels are mentioned.

Developments and improvements in the netzsonde are a primary factor in the success of midwater trawlers. The netzsonde tells the skipper the depth of the trawl, the height of the trawl mouth, the amount of fish in the trawl mouth, the amount of fish immediately above or below the trawl, and the temperature of the water at the trawl. (See the netzsonde echogram on the back of the card.) Included in the netzsonde equipment are a recorder unit, with transmitter and receiver; an electric winch, with control unit and some 2,000 m. of coaxial cable; a transducer; and a temperature sensor. The transducer is attached to the trawl's headrope with its face pointing toward the seabed. Thus the zero line on the echogram represents the headrope of the trawl. The groundrope appears as a second

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 Abstracter: L. Baldwin

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consists of ultrasonically sensitive, laminated nickel packs through which the initial signal and the returning echo are received and transmitted. When it has been lowered into the sea, it begins to turn automatically in 5-degree steps, transmitting and listening, moving another step, transmitting and listening, moving another step, etc.

Other components described are the various controls--the search sector controls, the gain control (for amplifying the signal on the echogram), the catch sector control, the training speed control (for setting the speed at which information is acquired when the vessel is moving in on a shoal), and the audio volume control. This latter device reproduces, by means of the loudspeaker, the sounds that are being visually recorded on the echogram. [14 figures]

Part Two -- The Basic Operation. Ibid. No. 11, 40-41 (November 1969)

Using sketches and reproductions of actual sonar recordings, the author illustrates the sequential operation of the sonar in conjunction with the movement of the vessel, the often fast swimming of the fish, and the effects of wind and current. The three-dimensional data produced by operation of the transducer tilt control are assimilated by helmsman and sonarman and coordinated to achieve the maximum catch. [8 sketches, 2 photographs]

2.115 A SHIP DESIGN PROCEDURE

Lamb, T. (Maryland Shipbuilding and Drydock Co., Baltimore, Maryland)
Marine Technology 6, No. 4, 362-405 (October 1969)

The author suggests that the small number of articles on practical ship design indicates that architects are reluctant to discuss this important part of the overall ship production sequence. He feels, however, that discussion of all aspects of ship design would stimulate progress in what is now an empirical art. He presents this paper in order to provide a basis for discussion. The primary sections of the paper are: general appraisal of the design problem, preliminary design calculations, resistance and propulsion estimate, sketch general arrangement, preparation of preliminary body plan, preliminary hydrostatics, preliminary capacities and centers, preliminary light ship weight and centers, preliminary trim and stability, preliminary general arrangement, preliminary tonnage estimate, preparation of scantling plans, detailed weights and centers, revised trim and stability, longitudinal strength, preparation of specifications, presentation of technical data. [14 figures, 15 tables, appendix, 45 references]

[Abstracter: F. T. Piskur]

2.3 SHRIMP DEHEADING APPARATUS

(I.85)

U.S. Patent 3,451,100

Lee, R. E. (pat.)

Food Technology 23, No. 11, 82 (November 1969)

The shrimp move within a trough on a narrow belt conveyor. The heads or tails are cleanly cut by a reciprocating cutter. A jet of water ejects the remaining portions of the shrimp. [Abstracter: F. T. Piskur]

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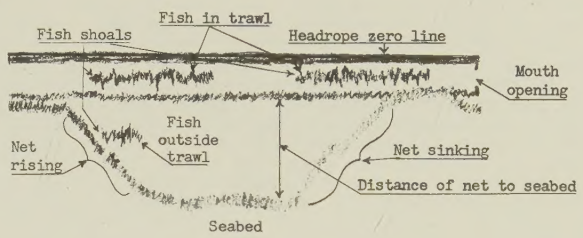
line below the zero line and indicates the height of the trawl mouth. Increasing the breaking strength of the coaxial cable to 1.5 tons and improving the drive in the electric winch that pays out the cable have largely eliminated many of the problems that plagued early netzsonde operations. [5 figures]



NETZSONDE ECHOGRAM

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Although the catching potential and the adaptability of this method of fishing have not been fully proven, WFA feels sufficiently optimistic to recommend it. It gives the fisherman a high degree of flexibility, permitting him to trawl or to seine as conditions permit; since conversion from one method to the other is very simple, he can try either without significantly interfering with his normal fishing routine. It eliminates the labor of stacking seine ropes and keeps the foredeck clear of them. It has special advantages for spot fishing close to shore or obstructions, since the fishing triangle is smaller and the operating cycle is faster than for traditional seining. Although less wire is usually shot and less ground covered, the catch rate is not necessarily lower, since the fishing cycle is shorter.

The disadvantages are most apparent in vessels having lower power and smaller equipment. Boats powered by 150 hp. engines or less will have difficulty towing the gear at depths of about 50 fathoms if more than 600 fathoms of wire is used per side--or if more than 300 fathoms is used on very soft bottoms. Since 600 fathoms of wire with cordage sweeps wound on top will completely fill a conventional drum, larger flanges or longer barrels may be required, necessitating a check with the winch manufacturer about the strength of the equipment. Extra fairleads may also be required.

Further information about the method is available from the Industrial Development Unit, White Fish Authority, St. Andrew's Dock, Hull, England.
[2 figures, 1 table]

2.1471 TRAWLING WITH NETZSONDE -- 2
(2.116)

Anonymous
World Fishing 18, No. 11, 48-49 (November 1969)

In single-boat pelagic trawling, the netzsonde is used after the fish shoal has been located by sonar and the trawl has been shot. The sonar, with its range of more than 1,000 m. ahead and to either side of the vessel, pinpoints the shoal and holds it till the vessel is overhead. Then the netzsonde, sounding downwards, picks up the shoal and permits the skipper to aim the trawl for maximum results. (The height of the trawl is controlled by variations of warp length or engine speed or by use of a controllable pitch propeller.) In good weather, when no speed is lost as a result of pitching, fishing within 1 m. of the bottom is possible.

When the skipper is fishing in depths of 1,000 m. or more, the netzsonde may be unable to record the seabed below the trawl mouth. To remedy this situation, the "up/down" netzsonde was developed. It has two transducers in the same casing; one points up and the other down; either can be switched in from the wheelhouse. The method of using these two units is explained in detail in the article.

At first, use of the one-boat midwater trawl for fish other than herring was not successful, for the echo traces lacked the degree of definition required for recognition of exploitable fish. By using such new components as integrated circuits, high-powered transistors, and newly developed ceramic transducers, engineers have developed echo sounders that can record single fish at depths of as much as 300 m. These echo sounders show large cod as comet traces, trash fish

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 Abstracter: L. Baldwin

3. FREEZING AND IRRADIATION OF FISH
(9.6) (3.23)
(3.15)

Kreuzer, Rudolf (ed.)
Fishing News (Books) Limited, Ludgate House, 110 Fleet Street, London, E.C.4, England. 528 pp. (1969)
Publications Division, Food and Agriculture Organization of the United Nations, Via delle Terme di Caracalla, 00100, Rome, Italy (copyright owners)

In September 1967, nearly 400 scientists and representatives of commercial interests gathered in Madrid to attend the FAO Congress on the Freezing and Irradiation of Fish. This book puts on permanent record the papers and discussions expressing the purpose of that congress.

The 80 papers, written by 161 authorities from 31 countries, have been grouped into six main categories. The papers constituting each category have, in turn, been grouped as follows:

Part I - Freezing Fish at Sea [127 pp., 77 figures, 41 tables, ~225 references]
- Techniques and equipment for freezing fish at sea
- Factors affecting quality of sea frozen fish
- Freezing media
- Superchilling

Part II - Freezing and Processing Frozen Fish [95 pp., 57 figures, 43 tables, ~250 references]
- Physical effects of freezing fish
- Specific problems and techniques in freezing fish

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 Abstracter: L. Baldwin

2.3 MICROWAVE OPENING OF OYSTERS--SOME ECONOMIC CONSIDERATIONS
(1.81)

Learson, Robert J. (U.S. Bureau of Commercial Fisheries, Gloucester, Massachusetts), and W. R. Stone (Raytheon Company, Waltham, Mass.)
Microwave Energy Applications Newsletter 2, No. 5, 9-12 (September-October 1969)

A brief microwave treatment of unshucked oysters causes the shells to open but does not cook the oyster. Learson et al. (1969) have shown that such treatment has no effect on the processing and storage characteristics of the shucked meat, nor does it affect the water uptake of the meat during washing. The pH, drip characteristics, bacterial numbers, and organoleptic quality of meat from microwave-treated oysters, either immediately after shucking or during refrigerated storage, differ very little from those of meat from untreated oysters. The question to be answered, then, concerns the economic feasibility of commercially processing oysters with microwave energy (2450 MHz).

The first problem facing the authors involved a determination of processing rates. Using a 10-kw. oven at three power levels and a 1.5-kw. oven, they determined the effect of power level on the processing rate and the percent of oysters opened.

Power	Oysters processed			Oysters opened
kw.	No./hr.	Bu./hr.	Bu./hr/kw.	percent
1.5	1,260	5.00	3.4	80
2.5	2,100	8.20	3.3	81
5.0	3,780	15.2	3.0	87
7.5	6,840	27.4	3.7	86

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 Abstracter: L. Baldwin

3.11 EFFECT OF GLYCEROL AND DIMETHYL SULFOXIDE ON CHANGES
(3.239) IN COMPOSITION AND pH OF BUFFER SALT SOLUTIONS DURING FREEZING

Van den Berg, L., and F. S. Soliman
Cryobiology 6, No. 2, 93-97 (September-October 1969)

The protective mechanism of organic compounds used to prevent freezing damage in biological materials is not clearly understood. Therefore, the authors studied the effect of glycerol and dimethyl sulfoxide, two compounds widely used in freezing, on changes that occur during freezing in the composition and pH of buffer salt solutions. Sodium and potassium phosphates and chlorides were the salts used. Phase relations during freezing for several single-salt solutions were determined in detail; for two-salt solutions, in less detail.

Either glycerol or dimethyl sulfoxide added to the salt solutions markedly decreased the magnitude of the changes studied; either decreased salt solubility at a given temperature but increased the amount of water remaining unfrozen. Of the two compounds, glycerol had the greater effect, for it reduced salt solubility less while maintaining about the same amount of water unfrozen. Under some conditions, dimethyl sulfoxide readily separated from solutions containing phosphate, thereby reducing its effectiveness as an additive.
[4 figures, 3 tables, 7 references]

 Abstracter: L. Baldwin

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To determine the savings in labor, they compared the time-motion profiles of two expert shuckers working on treated oysters with those of two expert shuckers from the same plant working on untreated oysters. For further comparison, they included data reported by Wheaton in 1969.

	Hand-shucking of		
	untreated oysters		treated oysters
	Wheaton data	Learson-Stone data	
Shucking rate (oysters/man/hr.)	462	502	660
(gallons/man/hr.)	1.70	1.84	2.43
(gallons/man/yr.)	1,224	1,325	1,750
Hourly wages	$2.72*	$2.94*	$3.00
Wage cost (per 720-man-hr. year)	$1,958.40	$2,120.00	$2,160.00
(per gallon)	$1.60	$1.60	$1.23

* At the standard rate of $1.60/gal.

As for equipment costs, a fully conveyorized 5-kw. oven (probably the best size for plants employing fewer than 20 shuckers) costs about $15,000; installation, interest, and auxiliary equipment cost about one-third as much as the oven, or $5,000; and power and maintenance, on the basis of one tube replacement every 2 years, cost about $3,000 a year. Using these figures, the authors compared the cost of shucking 24,000 gallons of untreated oysters per year with that of shucking 24,000 gallons of microwave-treated oysters a year. They conclude that the savings will be $300 a year plus the wages of 6 shuckers.
[3 tables, 4 references]

3.13 PRESERVING EFFECT OF OZONE TO FISH

Haraguchi, Tatsuichi, Usio Simidu, and Kazuyoshi Aiso (Department of Sanitary Bacteriology, Institute of Food Microbiology, Chiba University, Narashino, Chiba, Japan)
Bulletin of the Japanese Society of Scientific Fisheries 35, No. 9, 915-919 (September 1969) (In Japanese; tables, figures, and summary in English)

This paper reports on the preservative effect of ozone treatment of fresh jack mackerel and shimaaji (Caranx mertensi). The bacterial counts of the surface of gutted fish, soaked for 30 to 60 minutes in a 3 percent salt solution containing 0.6 p.p.m. of ozone were 1/100 to 1/1,000 the bacterial counts of control samples of untreated fish.

The storage life of gutted fish treated every other day by soaking in a brine-ozone solution was 1.2 to 1.6 times longer than that of control untreated fish. [3 figures, 5 tables, 4 references] [Abstracter: F. T. Piskur]

3.231 FILLING REFRIGERATOR DOORS

British Patent 1,150,555
English Electric Co., Ltd., London, England (pat.)
Modern Refrigeration and Air Conditioning 72, No. 858, 87 (September 1969)

Foam Plastic is pumped into refrigerator doors through pipes that lead to inaccessible parts, particularly the corners of the doors. The pipes eventually set into the surrounding foam. [Abstracter: F. T. Piskur]

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as fine gray marks. Thus a skipper has information that helps him decide which part of a shoal contains marketable fish. Two of these sounders are technically quite advanced. One, the Fischfinder 700, is used for vertical sounding and combines paper recording and oscilloscope presentation. It also has a bottom-lock capability--that is, the bottom trace remains stable and is unaffected by the ship's pitching motion. The other, the Echograph 600, serves as a vertical sounder or as a recording unit for the netzsonde, the particular application being chosen by means of a switch on the unit.

One particularly useful piece of information transmitted by the netzsonde is that of water temperature at trawl depth. The temperature sensor is positioned near the netzsonde and is connected to it by a short cable; its temperature-sensing circuit is triggered by the netzsonde's transmitter pulse, and its data are transmitted as a modulated carrier frequency through the netzsonde cable. These data are recorded on the netzsonde echogram as a broken line between the ground-rope trace and the seabed trace. Since fish are temperature sensitive, these data help a skipper avoid much wasted fishing time. [8 figures]

2.3 FISH DRESSING METHOD

U.S. Patent 3,453,684
Heck, H. F. (pat.)
Food Technology 23, No. 11, 82 (November 1969)

Slit cleaned fish are heated to bring the temperature of the skin to about 160° F. The skin is removed by exposure of the heated fish to a high-pressure stream of liquid. [Abstracter: F. T. Piskur]

3.

The effect of polyphosphate treatment
Freezing of tropical fish
Thawing frozen fish
Part III - Economics of Producing and Marketing Frozen Fish Products [91 pp., 31 figures, 13 tables, ~70 references]
The future of the shore-based freezing industry
Economic factors affecting the fish freezing industry
Economic considerations in the developing fish freezing industries
Product development
Part IV - The Quality of Frozen Fish Products and Its Assessment [63 pp., 36 figures, 18 tables, ~130 references]
Factors influencing quality of frozen fish products
Quality assessment
Part V - Storage, Packaging and Distribution of Frozen Fish Products [43 pp., 25 figures, 5 tables, ~ 25 references]
Design and operation of cold stores
Packaging and distribution of frozen fish products
Part VI - Preservation of Fishery Products by Irradiation [94 pp., 70 figures, 36 tables, ~250 references]
The quality aspects of seafood irradiation
Present status and considerations regarding wholesomeness
Economic aspects and production technology

Each paper is preceded by an English, a French, and a Spanish summary; each secondary category is followed by supplementary material derived from participants' discussions of the presented material. As a compilation of the latest information about the merits and capacities of refrigeration practices and irradiation techniques, this book is of practical importance to all who process and distribute fish.

3.12 USE OF SODIUM NITRITE IN SMOKED GREAT LAKES CHUBS
(3.4) (1.92)

Weckel, K. G., and Susan Chien (Department of Food Science and Industries, University of Wisconsin, Madison)
Research Report 51 (September 1969) (Research Division, College of Agricultural and Life Sciences, University of Wisconsin)

The effectiveness of $NaNO_2$ in inhibiting the growth of Clostridium botulinum type E has been attributed to the establishment of a bacteriologically aerobic condition and the presence of peroxides generated in the degradation of proteins. The use of nitrite in curing certain fish is permissible within the following established limits: a maximum of 10 p.p.m. $NaNO_2$ in smoke-cured tuna products; up to 200 p.p.m. in smoke-cured sablefish, salmon, and shad, the finished product of which may contain up to 500 p.p.m. $NaNO_3$. The use of not less than 100 p.p.m. and not more than 200 p.p.m. $NaNO_2$ in smoked chub has been proposed; this study was undertaken to determine the rate of uptake and retention of that nitrite in smoked chub.

Chub obtained from commercial sources were brined in circulating solutions of NaCl and $NaNO_2$ at 40° F. at a ratio of 2:1 (w/w) brine to fish and then smoked for 2.5-3 hr., during which the flesh of the chub was brought to 185° F. for 30 min. For nitrite analysis, the total edible flesh of the raw, the brined, and the smoked chub was removed and comminuted, and the amount of $NaNO_2$ recovered from the flesh and from solutions containing NaCl was measured.

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 Abstracter: L. Baldwin

3.25 FIRST CLOSED-CYCLE CRYOGENIC SYSTEM INTRODUCED FOR TRANSPORT INDUSTRY

Anonymous
Quick Frozen Foods 32, No. 3, 373-374 (October 1969)

A new closed-cycle, cryogenic transport system is claimed to be the first commercial refrigeration system to use equipment that has been proved by companies and agencies engaged in the aerospace program. It consists basically of a cryogenic cooler, a cryoconvector surface on which constant temperature is maintained at all points, and a temperature controller. Because of its small size (one-sixth the size of existing equipment) and weight (one-tenth that of existing equipment), its self-cycling process (which prevents loss of refrigerant), its refrigerating capacity (down to -425° F., twice that of conventional systems), and its input power requirements (substantially less than half that of conventional systems), it promises significant cuts in operating costs. It can be used to refrigerate transport containers or as an integral refrigeration system in trucks, railway cars, airplanes, or ships. It can also be used to freeze food or to refrigerate warehouses.

The system's mode of operation is a modified Stirling cycle. Its basic components are a compressor piston and cylinder and an expansion piston and cylinder, a regenerator, a cold head, an electric motor, and a heat rejection fan. One hermetically sealed unit contains helium and another a special gas mixture. The only parts of the system that are subject to any wear at all are the piston bearings. When the helium is liquified by compression, it reacts against the special

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 Abstracter: L. Baldwin

3.2340 FREEZING PRESERVATION OF ALASKA POLLACK
(3.2495) (3.239)

Matsuda, Yumiko (Tokyo Univ. of Fisheries, Minato-ku, Tokyo, Japan)
Bulletin of the Japanese Society of Scientific Fisheries 35, No. 9, 891-896 (September 1969) (In Japanese; figures, tables, and summary in English)

The flesh of Alaska pollock tends to develop a spongy texture during frozen storage. The author carried out a test to determine if vacuum freezing would retard or prevent the development of spongy meat. Cut meat from Alaska pollock was frozen by three methods: vacuum freezing, air-blast freezing at -35° C., and still-air freezing at -30° C. The frozen samples were stored at -25°, -15°, and -5° C.

The samples frozen in still air were found to be spongy immediately after the meat was frozen. The samples vacuum frozen and frozen in an air-blast freezer became spongy after 1 month of storage at -5° C. The author concluded that the meat from Alaska pollock could be stored for 3 months without developing a spongy texture if the meat is vacuum frozen and then stored at -15° C. or lower. In these tests, vacuum freezing reduced the moisture content of the meat by about 15 percent. [6 figures, 1 table, 8 references]

 Abstracter: F. T. Piskur

3.4 THE CHEMISTRY OF SMOKING
(9.6)

Kurko, W. I. (All-Union Meat Research Institute, Moscow, U.S.S.R.)
Published by Izdatielstwo Pishchewaja Promyshlennost, Moscow (1969)

The monograph, which is the second book published by the author on smoking, deals with all chemical aspects of smoke curing of meats and fish. Chapter 1 is devoted to the chemistry of smoke generation, including the chemical composition and the process of pyrolysis of wood components at different temperatures. The second chapter contains a discussion of parameters influencing the composition of smoke and a description of different methods of smoke generation used in the industry. Given in this chapter is a table of organic compounds that have been identified in wood smoke; the table contains 13 aliphatic acids, 4 dicarboxylic acids, 3 ketoacids, 5 aromatic acids, 11 aliphatic aldehydes, 5 dicarbonylic and heterocyclic aldehydes, 5 aromatic aldehydes, 14 ketones, 9 alcohols, 29 phenols, 5 amines, 9 aromatic hydrocarbons (including polycyclic carcinogens), and 4 other compounds. The deposition of smoke components and their diffusion into the smoked product is described in chapters 3 and 4. Chapter 5 contains a discussion of problems associated with the development of smoky taste and flavor, including the interaction of smoke components with the material of the product. The antioxidant effect of smoking is described in chapter 6. Here many original data obtained by the author himself are presented. The bactericidal activity of different woodsmoke components is discussed in chapter 7. The development of color on the surface of smoked goods and the role of different classes of smoke constituents

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 Abstracter: Z. E. Sikorski

3.2387 INSULATED CONTAINER

British Patent 1,152,279
Niedersachsische Waggonfabrik Joseph Graaff, G.m.b.H., Hannover, West Germany (pat.)
Modern Refrigeration and Air Conditioning 72, No. 858, 87 (September 1969)

The insulated container for carrying frozen meat is made up of panels of metal or plastic interspaced with a layer of foam. The container is fitted with crane hooks to facilitate its movement between ship and lorry.
[Abstracter: F. T. Piskur]

3.25

gas mixture through an interface. The liquified gas mixture is then fed into a cold head and through the cryoconvector, a 1.4-in. diameter aluminum pipe with an inner core of up to 60 ft. in length. The liquified gas mixture flows the length of the cryoconvector, absorbing the heat within the vehicle or room, vaporizes, and then returns to the cold head through the inner core of the cryoconvector for recycling. One or more clip-on fans circulate the cool air where pockets of heat would normally exist. Blower fans reject the heat.

The system comes prepackaged with a small generator (run by a small diesel engine). Since the unit is hermetically sealed at the factory, there is no problem of contamination by dirt, dust, or chemicals; and since no valves are used for operation, there are no constrictive passages through which gas must flow. Customers can buy the system outright or lease it. The first 5,000 hours of operation are guaranteed. [4 figures]

3.12 PASTE PRODUCTS

Japanese Patent 10146/69
Ezaki Glico Co., Ltd. (pat.)
Food Technology 23, No. 11, 82 (November 1969)

Dehydroascorbic acid or dehydroisoascorbic acid are added to meat and fish protein pastes to help promote stability of these products.
[Abstracter: F. T. Piskur]

3.12

Recovery was generally within 20 percent when measurements were made promptly, but lesser amounts were obtained when the comminuted flesh was held for from 48 to 72 hr. Salt in concentrations of up to 6 percent in the comminuted flesh did not affect the measurements. The $NaNO_2$ concentration in the chub 4 days after smoking was from 30 to 40 percent of that in the solution used for brining; 6 days after smoking, the concentrations tended to be slightly greater than those 2 days after smoking. When the levels of $NaNO_2$ were significantly greater than 100 p.p.m., the flesh ranged from slightly to definitely pink. The pink was not always uniformly distributed. The authors conclude that this color effect would make the use of nitrite self limiting. The smoked chub that had been treated in acidified NaCl brine containing nitrite had lower concentrations of nitrite than did chub brined in nonacidified brine containing nitrite. Thus significant concentrations of $NaNO_2$ can be produced in smoked chub by including the nitrite in the NaCl solution used for brining. The concentration of $NaNO_2$ in the smoked chub was reasonably stable within the intervals normally required for distribution.
[5 tables, 8 references]

3.4 SMOKED FLAVORING COMPOSITION

U.S. Patent 3,445,248
Miler, K. and Z. Kozlowski (pat.)
Food Technology 23, No. 11, 78 (November 1969)

Alkaline aqueous solutions of wood smoke are treated with carbon dioxide to convert the phenolates to phenols. The resulting phenols are removed with organic solvent. [Abstracter: F. T. Piskur]

3.4 SMOKE FLAVORING

Canadian Patent 815,478
Hollenbeck, C. M.; Red Arrow Products Corp. (pat.)
Food Technology 23, No. 11, 78 (November 1969)

Smoke-flavored edible oils are prepared by mixing edible oils and aqueous smoke-flavored solutions, and then removing the smoke-flavored oil that separates.
[Abstracter: F. T. Piskur]

3.4

in creating the smoky characteristics of the products are described in chapters 8 and 9. Finally, the chemical aspects of "smoking" without smoke are discussed. The long list of references contains 39 papers published by the author, a leading specialist in the field of woodsmoke analysis and the antioxidant activity of different smoke components, and a very large number published by D. J. Tilgner's group in Poland. Thus the monograph is a valuable bibliography of East European research on smoke curing technology. [577 references]

3.2349 FREEZE DRYING

British Patent 1,154.320
Unilever, Ltd. (Chester, England) (pat.)
Modern Refrigeration and Air Conditioning 72, No. 858, 87 (September 1969)

In freeze drying, the most common technique is to freeze dry the food on ribbed trays. These trays are difficult to clean. The problem is avoided by freeze drying the food in an open-topped package. The package is closed after the operation. [Abstracter: F. T. Piskur]

3.2493 STORAGE LIFE EXTENSION OF REFROZEN SILVER SALMON STEAKS

Yu, T. C., Mary K. Landers, and R. O. Slinnhuber (Department of Food Science and Technology, Oregon State University, Corvallis 97331)
Food Technology 23, No. 12, 106-108 (December 1969)

The object of this study was to produce frozen silver salmon steaks of good cold-storage-keeping quality from fish that had been frozen. The authors studied the use of water-misible BHA (butylated hydroxyanisole) and BHT (butylated hydroxytoluene), polyphosphate solutions, starch coating, and vacuum packing in cans. They found that refrozen silver salmon steaks maintained a high-quality level during 14 months of storage at 0° F. when they were treated with antioxidants and packed under vacuum in cans. [1 table, 15 references]
[Abstracter: F. T. Piskur]

6.190 ASSESSMENT OF THE NUTRIENT CONTENT OF ATLANTIC COAST HERRING FISH MEALS

Power, H. E. and K. A. Savagaon (Fisheries Research Board of Canada, Halifax, Nova Scotia), B. E. March and Jacob Biely (Department of Poultry Science, University of British Columbia, Vancouver, Canada)
Feedstuffs 41, No. 47, 48, 52 (November 22, 1969)

The authors used various chemical, physical, and microbiological procedures, and biological tests with chicks to assess the nutritive value of herring fish meals produced on the east coast of Canada. Fifty components or nutritive characteristics were analyzed. These included: proximate composition components, soluble protein, protein digestibility values, available lysine, amino acids, supplementary protein values, minerals, salt, metabolizable energy values, and vitamins. The table on the back of this card gives some of the pertinent data obtained.

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 Abstracter: F. T. Piskur

6.34 (8.69) TOCOPHEROL CONTENT OF SEAWEED AND SEAWEED MEAL. III. INFLUENCE OF PROCESSING AND STORAGE ON THE CONTENT OF TOCOPHEROLS, CAROTENOIDS AND ASCORBIC ACID IN SEAWEED MEAL

Jensen, A. (Norwegian Institute of Seaweed Research, N-7034 Trondheim-N.T.H., Norway)
Journal of the Science of Food and Agriculture 20, No. 10, 622-626 (October 1969)

The present study of brown algae was undertaken primiarly to establish the value of seaweed meal as a source of tocopherols in animal feedstuffs. The two previous papers in this series had established that the intertidal seaweed of the Fucacae family contains considerable quantities of tocopherols. The author demonstrated in the present study that the losses of tocopherols during the thermal dehydration process in the preparation of seaweed meals from Ascophyllum nodosum were normally small; more than 80 percent of the original tocopherol content of the fresh seaweed was retained in the freshly produced meals. He found, also, that the storage conditions normally applied by industry should secure satisfactory stability of ß-carotene and tocopherols; low temperature and low moisture content are essential to maintain acceptable stability. Wet storage of fresh seaweed prior to drying has a detrimental effect upon the stability of the resulting meal during subsequent storage in the dry state.
[6 figures, 1 table, 25 references]

 Abstracter: F. T. Piskur

6.190 ABSTRACTS OF PAPERS PRESENTED AT THE 58TH ANNUAL MEETING OF THE POULTRY SCIENCE ASSOCIATION

Anonymous
Poultry Science 48, No. 5, 1783, 1792, 1793, 1810, 1872, 1888-1889 (September 1969)

Among the papers abstracted in this section of the journal are the following.

"Comparisons of Fish Meals in Growing and Laying Rations for White Leghorns," by G. E. Bearse (Department of Animal Sciences, Western Washington Research and Extension Center, Washington State University, Puyallup 98371), H. H. Koehler, L. R. Berg, and R. E. Dougherty.
Meals from Pacific Ocean hake, British Columbia and Norwegian herring, and Peruvian anchovy proved satisfactory for growing, laying pullets. Hake meal introduced more objectionable flavor in the eggs than any other meal, and anchovy meal produced smaller birds giving fewer eggs.

"Comparison of Amino Acid Content and Availability of Different Fish Meals," by Alfonso Burgos, J. I. Floyd, and E. L. Stephenson (Department of Animal Sciences, University of Arkansas, Fayetteville 72701).
The content and availability of amino acids--particularly cystine, methionine, and lysine--varied appreciably in seven different fish meals; Peruvian and herring meals were highest in these amino acids.

(over)

 Abstracter: L. Baldwin

6.52 PROBLEMS IN MINK FEEDING

Jørgensen, Gunnar (National Research Institute of Animal Nutrition, Experimental Fur Farm, Trollesminde, Hillerød, Denmark)
Papers presented at the fourth training course and conference of the Fur Breeders' Association of the United Kingdom, April 12 and 13, 1969

Other than the fact that mink should be fed according to standard with very fresh feeds constituting a balanced diet, we know very little about feeding mink. Part of this ignorance is due to the preponderance of feeds of animal origin that make up the minks' diet (animal feedstuffs vary widely in nutritional content and quality and, therefore, in effect on the animal), and part is due to the relatively small amount of research that has been done on mink feeding problems.

A. Special Problems in Mink Feeding (10 pp.)

In this first of two papers presented to the Fur Breeders' Association, the author discusses the variations in the protein, fat, and carbohydrate content of standard feeds. He explains why too much of a given ingredient in the diet--fish offal, slaughterhouse offal, ensiled herring, soya-bean oil, or wheat bran, for example--can be as disastrous to the physical well-being of the mink as too little. And, in view of the economic importance of mink production, he suggests that research on mink problems comparable to research on the problems of other domestic animals is warranted. [1 figure, 7 tables]

(over)

 Abstracter: L. Baldwin

6.190

"Effect of Moisture on the Salmonella Populations in Animal Feeds," by Virginia L. Carlson and G. H. Snoeyenbos (Department of Animal Sciences, Paige Laboratory, University of Massachusetts, Amherst 01002).
Salmonella populations in fish meals are relatively stable at the 5 and 10 percent moisture level; they grow at the 30-percent level. Multiplication occurs during the first 4 days and correlates with the water activity.

"A Study of the Chick's Requirement for Dietary Iron," by James C. Fritz, J. William Boehne, and Talmadge Roberts (Division of Nutrition, Bureau of Science, Food and Drug Administration, Department of Health, Education and Welfare, Washington, D.C. 20204).
Anemic chicks responded to iron from feed sources, including fish protein concentrate.

"Utilization of Catfish Offal in Chick Diets," by L. V. Skoch, C. W. Deyoe, G. D. Miller, and P. E. Sanford (Department of Grain Science and Industry, Kansas State University, Manhattan 66502).
Growth performance of chicks fed diets supplemented with catfish offal--including head, viscera, and skin--was equal to that of chicks fed diets supplemented with marine fish meal. Amino-acid compositions of the two supplements were comparable in nutritional quality.

"Evaluating Fish Meal for Feeding of Broilers," by J. B. Ward (Department of Poultry Science, 216 Scott Hall, North Carolina State University, Raleigh 27607).
Fish meal processed by the heat-transfer method gives significantly better feed conversion when used in a low-protein corn-fish diet than fish meal processed by the conventional method. In a least-cost practical diet, the difference is insignificant.

6.190

Nutrient content of seven Atlantic Coast herring fish meals

Component	Unit	Value expressed as average or average with standard deviation
Moisture	Percent	6.7
Ether extract		8.89± 0.922
Protein		73.6 ± 0.945
Ash		10.4 ± 0.202
Calcium		2.1 ± 0.24
Phosphorus		1.8 ± 0.095
Protein digestibility	Percent of crude protein	94.5 ± 0.49 1/ 90.6 ± 1.08 2/
Available lysine	Percent of the meal	5.7 ± 0.31
	Grams per 100 grams of protein	7.8 ± 0.50
Supplementary protein value	- -	128.4 ± 3.5 3/ 111 ± 3.2 4/
Metabolizable energy value	- -	1,572 ±73.8
Salt (NaCl)	Percent	1.41± 0.21

1/ Pepsin digestibility using 0.2 percent of a 1:10,000 preparation.
2/ Pepsin digestibility using 0.002 percent of a 1:10,000 preparation.
3/ When the test meals supplied 4 percent of the dietary protein.
4/ When the test meals supplied 8 percent of the dietary protein.

6.52

B. Economical Problems in Mink Feeding (12 pp.)

Since even small alterations in feed composition can improve mink production, the most economical form of feed is not always the cheapest. In this second paper, the author examined the extent to which the factors that can be influenced by feeding affect the cost of production and the sales price of the skins. The basis of discussion is a definition of economical feeding: the cheapest possible feeding that will comply with the minks' requirements for achieving the maximum genetic capacity for fertility, size, quality, and color. Prerequisite to an estimation of these requirements is as correct an estimate as possible of the nutritive content, the nutritive value, and the specific effects of both individual feed ingredients and feed mixtures. Also discussed are hygiene standards of feeds. [3 figures, 7 tables]

6.52 MINK FOOD CONCENTRATES

British Patent 1,153,118
Trouw and Co. (pat.)
Food Technology 23, No. 11, 90 (November 1969)

Mixtures containing molten fat (not less than 15 percent), starchy material (15 percent), and crude protein (not less than 25 percent) are allowed to congeal in a hard mass. The product is then granulated and is used as a reconstitutable foodstuff for mink. [Abstracter: F. T. Piskur]

6.190 THE EFFECT OF THE GUT FLORA ON THE GROWTH RESPONSE OF THE CHICK TO FISH SOLUBLES

Harrison, G. F., and M. E. Coates (National Institute for Research in Dairying, Shinfield, Reading, England)
The Proceedings of the Nutrition Society 28, No. 2, 70A (September 1969)

The authors found that dietary fish solubles had a small, nonsignificant effect on growth of germ-free chicks, but significantly improved growth when the chicks were given fresh or autoclaved droppings. Apparently, the growth-promoting activity of fish solubles requires the presence of the nonfilterable fraction of chick droppings that depresses growth. The effect seems to be largely dependent on the presence of a microflora. But, this is evidently not entirely so, because a small dose of autoclaved droppings also depressed growth. Dietary fish solubles completely counteracted this depression but only partially reversed the more severe depression in the chicks given fresh droppings.
[1 reference] [Abstracter: F. T. Piskur]

6.34 ALGIN GELS

U.S. Patent 3,455,701
Miller, A., and J. K. Rocks; Kelco Co. (pat.)
Food Technology 23, No. 11, 82 (November 1969)

Improved gels are obtained from aqueous solutions of alginates, sodium tripolyphosphate, adipic acid, calcium carbonate, and magnesium salt. The magnesium salt is added in the amount sufficient to produce a clear gel.
[Abstracter: F. T. Piskur]

7.51 (7.599) DETERMINATION OF PROTEIN THIOL GROUPS BY ATOMIC ABSORPTION SPECTROMETRY

Suzuki, Masami, Thomas L. Coombs, and Bert L. Vallee (Biophysics Research Laboratory, Department of Biological Chemistry, Harvard Medical School, and Division of Medical Biology, Peter Bent Brigham Hospital, Boston, Massachusetts 02115)
Analytical Biochemistry 32, No. 1, 106-117 (October 15, 1969)

The authors developed a method for the determination of mercury by atomic absorption spectroscopy and applied the method to the determination of thiol groups in proteins. After reaction of the protein with p-chloromercuribenzoate, the excess unbound reagent is removed by dialysis or by gel filtration chromatography, and the amount of mercury bound to thiol group of the sample is measured directly by atomic absorption spectroscopy. The method is precise, accurate and sensitive. The limit of detection of mercury was found to be 0.1 µg./ml. Because of the increased sensitivity of the atomic absorption technique, one-thirtieth the amount of protein required for the usual spectrophotometric method is required for analysis. The time required for analysis is reduced significantly without loss of precision and accuracy by separating the excess unreacted reagent by gel filtration instead of by dialysis.
[2 figures, 6 tables, 24 references]

 Abstracter: F. T. Piskur

7.592 (1.12) (7.74) REFLECTANCE CHARACTERISTICS OF CANNED TUNA. 2. THE RELATIONSHIP OF PIGMENT CONCENTRATION TO LUMINOUS REFLECTANCE AND COLOR EVALUATION

Little, Angela C. (Department of Nutritional Sciences, University of California, Berkeley 94720)
Food Technology 23, No. 11, 134-136 (November 1969)

In part I of this series (1969), the authors presented evidence linking visual appraisal of the color of a sample of canned tuna with the instrumental determination of green reflectance readings (CIE-Y values). However, the reflectance characteristics must be dependent to a large extent on the concentration of heme pigments in the muscle--the lighter the tuna, the lower the content of pigment. The heme pigment in the sample of canned tuna (prepared for reflectance measurements by homogenizing the meat in the presence of air) is probably in the ferrihemochrome state; the pigment can be reduced to the ferrohemochrome state by reducing agents such as sodium dithionite. In the present study, the author demonstrates a method for the evaluation of the change in chromaticity (a psychophysical measure that correlates with visually perceived differences in hue and saturation) on treatment of canned tuna samples with sodium dithionite. She found that the magnitude and direction of the chromaticity shift is related to the level of luminous reflectance of the sample and to the visual scores as evaluated by expert panels, and is directly related to the concentration of hemochrome pigment. The method may be a potentially useful one for the quality evaluation of canned tuna when used as a supplementary tool to the CIE-Y value determinations.
[1 figure, 2 tables, 4 references]

 Abstracter: F. T. Piskur

7.525 (6.195) A CHICK BIOLOGICAL ASSAY FOR AVAILABLE TRYPTOPHAN

Harwood, E. J., and D. H. Shrimpton (Unilever Research Laboratory, Colworth/Welwyn, Sharnbrook, Bedford, England)
The Proceedings of the Nutrition Society 28, No. 2, 66A-67A (September 1969)

The following basal diet is satisfactory for chick biological assay of available tryptophan in vegetable and animal proteins when the amounts added provide not more than 0.03 percent of tryptophan: Maize gluten feed (29 percent crude protein), 58.3; gelatin, 8.5; dried whey, 2.5; maize oil, 2.0; mineral mixture (Dean and Scott, 1965), 4.6; vitamin mixture (Dean and Scott, 1965), 2.0; choline chloride, 0.2; L-lysine hydrochloride, 0.36; DL-methionine, 0.29; and procaine penicillin, 0.01. The diet was brought up to 100 percent with test material and a filler consisting of a mixture of fine sawdust, kaolin, and maize oil. The sawdust and kaolin were present in a 2:1 ratio. The amount of maize oil was adjusted so that the filler and test material had the same metabolizable energy content. The mean values for total and available tryptophan in four samples of Norwegian herring meal were 1.15 and 0.76 g./16 g. nitrogen. The standard error of the biological determination for the herring meals was 0.01. [1 table, 2 references]

 Abstracter: F. T. Piskur

7.599 (7.51) DETERMINATION OF THE REACTIVE SULFHYDRYL GROUPS IN HEME PROTEIN WITH 4,4'-DIPYRIDINEDISULFIDE

Ampulski, Robert S., Valborg E. Ayers, and Samuel A. Morell (Department of Biochemistry, Milwaukee Blood Center, Inc., and Marquette School of Medicine, Inc.)
Analytical Biochemistry 32, No. 1, 163-169 (October 15, 1969)

In the determination of thiols by disulfide exchange with ortho and para dithiopyridines, the corresponding pyridones are formed. The ultraviolet spectra of the pyridones are quite different from those of the parent disulfides. With simple thiols and colorless proteins, the reaction can readily be followed spectrophotometrically. 4,4'-Dithiodipyridine (4-PDS) is the more sensitive reagent--the pyridone formed from 4-PDS exhibits a peak absorbancy almost three times that formed from the 2-PDS isomer. The sensitivity of the method was not affected by background absorbancy because the disulfides exhibit practically no absorption at the peak wavelengths of their corresponding pyridones. In the present study, the authors showed that the 4-PDS method is useful in detecting conformational changes in mammalian hemoglobins--for example, those that occur during reversible oxygenation. [4 figures, 16 references]

 Abstracter: F. T. Piskur

7.524 (6.195) A CHICK BIOLOGICAL ASSAY FOR AVAILABLE METHIONINE

Harwood, E. J., and D. H. Shrimpton
The Proceedings of the Nutrition Society 28, No. 2, 67A-68A (September 1969)

The authors used a basal diet of groundnut meal supplemented with gelatin and pure amino acids for the chick biological assay of methionine.

The percentage composition of the diet was: Extracted decorticated groundnut meal (49 percent crude protein), 26.6; gelatin, 6.16; dried whey, 5.0; maize oil, 5.0; fine sawdust, 5.0; mineral mixture (Dean and Scott, 1965), 4.6; vitamins mixture (Dean and Scott, 1965), 2.0; procaine penicillin, 0.01; L-lysine hydrochloride, 0.420; L-cystine, 0.267; L-tryptophan, 0.063; L-valine, 0.126; L-leucine, 0.364; L-isoleucine, 0.163; and L-threonine, 0.131. The diet was brought to 100 percent with test material and maize starch. The assay was carried out by the method described by Harwood and Shrimpton (1969). The mean values for available methionine in four samples of Norwegian herring meal was 2.56 g./16 g. nitrogen. The standard error of the biological determination for the herring meal was 0.36.
[1 table, 4 references] [Abstracter: F. T. Piskur]

6.37 SEAWEED BEVERAGES

Japanese Patent 10152/69
Star Shokuhin Kogyo K.K. (pat.)
Food Technology 23, No. 11, 90 (November 1969)

Beverages are prepared by treating aqueous suspensions of pulverized seaweed with proteolytic enzymes and amylase. [Abstracter: F. T. Piskur]

7. MODERN ANALYSIS

Kienitz, H. (Forschung, Badische Anilin-u. Soda-Fabrik A.G., 67 Ludwigshafen, West Germany)
Angewandte Chemie (International Edition) 8, No. 10, 733-750 (October 1969)

Modern analysis has little in common with the analytical chemistry of two or three generations ago that is still being taught in colleges. The modern chemist must bring himself up to date and acquaint himself with this important branch of knowledge, which links together chemistry, physics, mathematics, biology, medicine, and many aspects of technology. Analysis is undoubtedly an independent field of instruction and research. Modern analysts should be familiar with mathematics, physical measuring techniques, electronics, data processing, information theory, and logic. Such knowledge will enable them to take part in the development of a rapidly growing new field, "information optimization"--that is, the logical, exhaustive, and correct evaluation of analytical information from material processes and their critical appraisal and reduction to essential facts.
[25 figures, 4 tables, 7 references] [Abstracter: F. T. Piskur]

6.37 CONDIMENT MIXTURES

Japanese Patent 10153/69
Kyowa Hakko Kogyo Co., Ltd. (pat.)
Food Technology 23, No. 11, 90 (November 1969)

Crystalline or powdered condiments are coated with a solution of hydroxylated tangle (seaweed). [Abstracter: F. T. Piskur]

7.524 A NEW CONVENIENT METHOD FOR ESTIMATION OF TOTAL CYSTINE-CYSTEINE IN PROTEINS

Spencer, Richard L., and Finn Wold (Department of Biochemistry, University of Minnesota Medical School, Minneapolis 55455)
Analytical Biochemistry 32, No. 1, 185-190 (October 15, 1969)

The commonly used method for the determination of cystine and cysteine in proteins is based on the oxidation of the amino acids to cysteic acid. Performic acid has been used as the oxidizing agent. The method of analysis for cystine and cysteine consists of the following steps: preparation of performic acid, oxidation of the protein, lyophilization of the material, and amino-acid analysis of the lyophilized sample. By this method the conversion of the two amino acids to cysteic acid is 85-90 percent complete. Recently, HBr has been employed as a reducing agent to destroy excess performic acid before hydrolysis, and the conversion of the amino acids to cysteic acid has been 95 percent. Also, this procedure permits the quantitative conversion of methionine to methionine sulfone.

The present authors found that cystine and cysteine are converted to cysteic acid when the acid hydrolysis is carried out in the presence of low concentrations of dimethyl sulfoxide (DMSO). The hydrolysis of the proteins is carried out in 6N HCl containing 0.2-0.3 M DMSO. The cysteic acid can be determined by direct amino-acid analysis. Because several other amino acids are altered under these hydrolysis conditions, the rest of the amino acids must be determined from parallel hydrolyzates carried out in the conventional manner in the absence of dimethyl sulfide.
[2 tables, 19 references] [Abstracter: F. T. Piskur]

7.592 (1.12)(7.74) REFELECTANCE CHARACTERISTICS OF CANNED TUNA. 3. OBSERVATIONS ON PHYSICAL AND CHEMICAL PROPERTIES OF THE PIGMENT SYSTEM

Little, Angela C.
Food Technology 23, No. 11, 136-140 (November 1969)

This paper is the third in a series reporting on studies of the pigment system of canned tuna by means of reflectometric and colorimetric techniques. The purpose of the work was to develop an objective method for measuring the color characteristics of tuna for use in quality control and grading of tuna products. The author presents evidence that the state of the characteristic coloration in canned tuna is intermediate the ferro- and ferrihemochrome stages. She postulates that the hemochrome pigment in canned tuna is oxidized in two stages. The first stage is rapid and is completely reversible, involving the change of state of the iron in the pigment moiety from Fe^{++} to Fe^{+++}. The second stage is slow and is not reversible by the reducing agent dithionite. The second stage apparently involves degradative oxidation of the porphyrin ring. Presumptive evidence was obtained indicating that ascorbic acid blocks the second stage of the oxidative process and maintains the intact pigment in the ferrihemochrome state. The author suggests that colorimetric techniques may possibly be used in studies of the chemical and physical properties of biological systems.
[5 figures, 4 tables, 7 references] [Abstracter: F. T. Piskur]

7.874 (3.30) CATTY TAINTS IN FOODS

Anonymous
Condensed and adapted from a report by R. Spencer, Manager of British Food Manufacturing Industries Research Association (BFMIRA)
Food Technology 23, No. 11, 40-41 (November 1969)

Sporadic outbreaks of "catty" taints in food have occurred in several countries during the past 10 years. The particularly unpleasant catty odor has also been likened to the odor of onions, garlic, and the flowering currant. Chilled, frozen, and canned meat and vegetable products have been involved. Studies at BFMIRA showed that mesityl oxide $(CH_3)_2C=CH-CH_3$ could give catty odors to foods under certain conditions. In several outbreaks, the catty odor developed from the product of the reaction of mesityl oxide with hydrogen sulfide. Apparently, mesityl oxide may be a trace component of ketonic solvents that may be used around areas where food is grown, stored, processed, or packaged. It may be a contaminant of solvents used for insect sprays, paints, colors, flavors, and packaging materials.

Suspect material may be screened as follows:

1. Seal the material in a glass ampule with a saturated solution of H_2S in a buffer at pH 11. Heat ampule for 30 min. at 100° C., then cool. Break ampule and smell material to determine whether a catty smell is present.

2. Coat the inside of a small can with the material (a paint or lacquer). Let coated can stand until material is dry. Place about 50 g. of fresh beef in

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 Abstracter: F. T. Piskur

8.59 (0.38) LEVELS OF OXIDIZED AND REDUCED NICOTINAMIDE-ADENINE DINUCLEOTIDES IN FISH TISSUES

Shimizu, Chiaki (Lab. of Marine Biochem. Fac. of Agr., The Univ. of Tokyo, Tokyo, Japan), Kenji Abe, and Fumio Matsuura
Bulletin of the Japanese Society of Scientific Fisheries 35, No. 10, 1034-1040 (October 1969) (In Japanese; figures, tables, and summary in English)

This report presents data on the concentration of NAD, NADH (nicotinamide adenine dinucleotide and its reduced form), NADP, and NADPH (nicotinamide adenine dinucleotide phosphate and its reduced form) in the various tissues of fish. Twenty-two fish were examined. The total amount of NAD and NADH in the regular muscle of the fish was about 20 mg.percent and was several times greater than the total amount of NADP and NADPH. The total amount of each coenzyme in the red (dark) muscle of the fish was more than twice that in the regular muscle. The total amount of each coenzyme in the internal organs (liver, kidney, heart) was several times that in the regular muscle. The authors indicated that each coenzyme was found to exist in the tissues generally in the reduced form. This condition may be characteristic for fishes.
[2 figures, 1 table, 17 references]

 Abstracter: F. T. Piskur

9.11 THE OCEAN

Anonymous
Scientific American 221, No. 3, (September 1969)

This entire issue is devoted to the ocean. Articles include:
"The Oceans," by Roger Revelle (A discussion of the uses of the ocean.) pp. 54-65.
"The Origin of the Oceans," by Edward Bullard (In a geological sense, the floor of the deep oceans is young.) pp. 66-75.
"The Atmosphere and the Ocean," by R. W. Stewart (The oceanic circulation is driven primarily by the wind and by density differences.) pp. 76-86.
"The Continental Shelves," by K. O. Emery (The Continental Shelves are alternately exposed and submerged as the glaciers advance and retreat.) pp. 106-114, 115, 118, 120-122.
"The Deep Ocean Floor," by H. W. Menard (The floor is crested in vast tectonic plates that grow outward from the midocean ridges.) pp. 126-132, 134, 136.
"The Nature of Oceanic Life," by John D. Isaacs (The chain of life in the ocean begins with a dilute broth of photosynthetic organisms.) pp. 146-162.
"The Physical Resources of the Ocean," by Edward Wenk, Jr. (The physical resources include not only minerals but also water itself and the fragile shoreline.) pp. 166-176.
"The Food Resources of the Ocean," by S. J. Holt (The annual harvest is 55 million tons.) pp. 178-182, 187-194.

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 Abstracter: F. T. Piskur

9.12 (9.6) THEORY OF FISH POPULATION DYNAMICS

Nikolskii, George V.
Oliver & Boyd, Tweeddale Court, 415 High Street, Edinburgh 1, Scotland (n.d.), 323 pp. 170s
Michael Holden (reviewer)
New Scientist 44, No. 678, 521 (December 4, 1969)

This book is the English version of a work published in Russian in 1965. It is not just another repetitious treatment of familiar material. It is not a handbook showing how to get a set of parameters and fit them to a formula--in point of fact, complex mathematical equations are absent. Rather, it expounds the view that fish population dynamics should be developed by biologists as well as mathematicians, for living systems are involved.

The author deals with the components of population dynamics, chapter by chapter, by reviewing the literature and summing up the conclusions that can be drawn from the data presented. This method of treatment is valuable in that it draws attention to the work, both marine and fresh water, that has been done on the subject. The chapter entitled "Principles for Raising the Productivity of Fish Populations" is of especial value to people concerned with the international regulation of fisheries in the North Atlantic.

 Abstracter: L. Baldwin

9.12 THE FEEDING HABITS OF THE GREEN CRAB, CARCINUS MAENAS (L.)
(9.15) (1.80)

Ropes, John W. (U.S. Bureau of Commercial Fisheries, Biological Laboratory, Oxford, Maryland 21654)
Fishery Bulletin 67, No. 2, 183-203 (October 1968)

The New England landings of soft-shell clams (Mya arenaria) declined from a high of 14,700,000 lb. in 1938 to a low of 2,300,000 lb. in 1959. Several authors during the early and mid 1950's reported that predation by the green crab (Carcinus maenas) was the most probable cause of the decline. To determine the impact of this predator on its environment, including the soft-shell clam, the present author observed the crab's feeding behavior under natural conditions. Among his observations are the following: pelecypods are a dominant part of the crabs' diet; feeding is heaviest at night and at high tide; water temperatures below 7° C. inhibit feeding activity--low salinities apparently have no effect; female crabs, being more numerous than males, are probably more destructive to the clam fishery than males. [Abstracter: L. Baldwin]
[10 figures, 9 tables, 43 references]

6.55 ANIMAL FEEDS 1970
(6.1) (9.6)

Gutcho, M.
Food Processing Review No. 10, 350 pp. (n.d.) $35
Noyes Data Corporation, Noyes Building, Park Ridge, New Jersey 07656

This book, which is based on the patent literature, covers 278 processes dealing with a wide variety of methods for the preparation of modern animal-food compositions from conventional or new sources; for preparing more digestible, more acceptable supplements; and for improving the stability of feeds to time, temperature, and moisture. [Abstracter: L. Baldwin]

4.7 OIL REFINING

U.S. Patent 3,454,608
Seip, P. J.; Lever Brothers (pat.)
Food Technology 23, No. 11, 80 (November 1969)

Glyceride oils are refined by a continuous process using an alkaline treatment. The oil flows smoothly through a series of stages on the surface of an aqueous solution of the alkali. The process, in stages, is carried out in such a way that the soap layer formed by the reaction is dispersed into the aqueous phase so that a fresh aqueous surface continuously appears at the interface of the two liquids. [Abstracter: F. T. Piskur]

8.51 A BLUE PIGMENT FROM THE MUSCLE OF A MARINE TELEOST, "HIROSA", CHEILINUS UNDULATUS RÜPPELL

Yamaguchi, Katsumi, and Fumio Matsuura (Lab. of Marine Biochem. Fac. of Agr., The Univ. of Tokyo, Tokyo, Japan)
Bulletin of the Japanese Society of Scientific Fisheries 35, No. 9, 920-926 (September 1969)

Small sized hirosa show a greenish-blue coloration of the epidermis and vertebra; the large fish also show green to blue coloration of the flesh. The author demonstrated that the blue pigment found in a large hirosa was a chromoprotein having biliverdin as its prosthetic group.
[2 figures, 3 tables, 13 references] [Abstracter: F. T. Piskur]

7.874

the can; fasten the lid to the can with cellulose tape; and allow can and contents to stand for 48 hr. at about 5° C. Examine the meat for catty odor.
If a catty odor is absent, place the meat in an untreated can, seal a clean end to the can, then heat the can and contents at 240° for 1½ hr. in a pressure cooker. After the can is cool, open it and examine the meat for catty odors.

9.11

"Technology and the Ocean," by William Bascom (Advances in the development of resistant materials and huge ships expand the uses of the sea.) pp. 198-204, 206, 208, 210, 213-214, 216-217.
"The Ocean and Man," by Warren S. Wooster (This paper considers the problem of how men of all nations can study and exploit the ocean for their mutual benefit.) pp. 218-220, 224-226, 228, 230, 232, 234.

9.12 CRABS IN HOT WATER

Anonymous
New Scientist 44, No. 679, 557 (December 11, 1969)

Two scientists at the University of North Carolina reared batches of mud crabs in waters whose temperature varied between 15° and 35° C. Some of the waters were kept at a constant temperature within this range, while in others the temperature went through a daily cycle of either 5° or 10° C. In terms of the percentage of crabs that hatched and survived to maturity, the optimum constant temperature was about 23° C. With one notable exception, the survival rate and development time of most of the crabs raised in fluctuating temperatures were roughly the same as for the crabs raised at the corresponding constant temperatures. This exception involved crabs raised in water that was cycled between 30° and 35° C. The survival rate for crabs raised at a constant 30° was 58 percent; at a constant 35°, it was 2 percent; but at a temperature cycling between 30° and 35°, it was 85 percent. Moreover, the development time of the crabs raised under these latter conditions was 11.5 days, whereas that of crabs raised at a constant 25° was 19 days.

The experimenters point out that the mud crabs used in the experiments, which were repeated five times with essentially the same results, are very unlikely to encounter these temperatures in their natural environment. Therefore, they suggest, the temperature must affect the crab larvae in some way. Their conclusion is that thermally polluted waters might be harnessed to improve crab harvests.
[Abstracter: L. Baldwin]

9.17 (9.3) CONSERVATION, "NEW CONSERVATION" AND ECOMANAGEMENT

Mayda, Jaro (University of Puerto Rico)
Wisconsin Law Review 1969, No. 3, 788-799 (1969) (University of Wisconsin, Law School, 975 Bascom Mall, Madison 53706)

The author states that existing concepts of conservation and natural resources are inadequate to identify the problems and to formulate the hypotheses toward their solution; they are the product of an unwillingness to view the environment and resource problems as a complex whole. Concepts must be employed that express not only the scope, but also the interrelations and the dynamics of all elements of our environment, the causes of actual and potential problems, and the available or anticipated means toward their correction, solution, or prevention. Such an approach will include the following features: (1) openness and flexibility--preconditions of any effort to apply policy in the form of practical planning and management models; (2) a complete open catalog of all types of resources and all areas of concern--to provide a base for comprehension of their interrelation; (3) balance of the various forms of management (exploitation, development, conservation, rehabilitation, nonuse and shifts in emphasis); (4) an operational value system--includes priorities and benefit-cost considerations; and (5) an umbrella concept of ecology and its derivative human ecology.

An understanding of the field makes clear the need to develop a comprehensive policy of treatment. The policy elements include: (1) policy must be based on all available knowledge, encompassing all major disciplines (scientific, technological, sociocultural) and in all relevant forms (measurable data, probable

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 Abstracter: F. T. Piskur

9.17 BRINGING RESOURCE CONSERVATION INTO THE MAIN STREAM OF AMERICAN THOUGHT

Hutchison, S. Blair (Intermountain Forest and Range Experiment Station, U.S. Department of Agriculture, Forest Service, Ogden, Utah 84401)
Natural Resources Journal 9, No. 4, 518-536 (October 1969)

The failure of the American people to respond more aggresively to the needs of conservation is primarily because the issues have never been properly described to them. Conservationists and resource agencies have not yet developed a coherent total picture of the renewable resource situation and its relation to the objectives of society. There are three needs: (1) to clearly relate the renewable natural resources and their management to the goals of our society, (2) to develop and gain acceptance of a comprehensive code defining the responsibility of society in relation to its resources, and (3) to develop clear objectives as anchor points for management decisions.
[32 references]

 Abstracter: F. T. Piskur

9.19 WATER - 1969
CHEMICAL ENGINEERING PROGRESS SYMPOSIUM SERIES

Cecil, Lawrence K. (ed.)
Published by the American Institute of Chemical Engineers, 345 East 47th Street, New York, N.Y. 10017. vol. 65, no. 97, 315 pp. (1969)

The report contains 43 papers covering a wide range of interests concerning waste disposal and water pollution control. Pertinent articles of interest to the fisheries follow.

"Ultimate Disposal of Wastewater: A Philosophical View," by Robert B. Dean;
"Ultimate Disposal of Wastes to Soil," by R. C. Routson and R. E. Wilding;
"Ultimate Management of Radioactive Liquid Wastes," by Cyril M. Slansky and James A. Buckham;
"Disposal of Liquid and Particulate Wastes to the Ocean," by D. J. Baumgartner;
"Waste Heat and Water Environment," by Julian Hemens;
"Economics of Induced River Aeration," by William Whipple, Jr.;
"In Situ Treatment of Rivers and Streams," by Melvin F. Katzer;
"Some Recent Advances in Water Treatment Technology," by Sigurd P. Hansen, Gordon H. Richardson, and Andrew Hsiung.

 Abstracter: F. T. Piskur

9.19 (9.13) PARATHION--USE OF BLOOD CONCENTRATION TO DIAGNOSE MORTALITY OF FISH

Mount, Donald I. (National Water Quality Laboratory, Duluth, Minnesota 55804) and Harvey W. Boyle (Cincinnati Water Research Laboratory, Cincinnati, Ohio 45226)
Environmental Science and Technology 3, No. 11, 1183-1185 (November 1969)

Diagnosis of specific causes of fish kills is often difficult. The present paper reports on the measurement of blood concentration of parathion as a diagnostic tool to detect fish mortality caused by acute exposure of the fish to parathion dissolved in water. Catfish, Ictalurus nebulosus (Le Sueur), were exposed to various concentrations of technical grade parathion (80 percent active) dissolved in water for periods of up to 30 days. The concentration of parathion in the blood correlated with that found in the water. Diagnosis of mortalities of catfish caused by acute exposure to parathion can be made by measuring the amount of unaltered parathion in the blood. Further research is necessary to determine if the method applies to other species of fish and to determine whether parathion occurs in higher concentrations in the muscle than in the blood.
[2 figures, 2 tables, 9 references]

 Abstracter: F. T. Piskur

6.54 SHAPED FISH PRODUCT

British Patent 1,157,517
Hammerschmidt, P. (pat.)
Food Technology 23, No. 12, 69 (December 1969)

The waste material obtained when frozen fish are sawed is homogenized and formed into patties for cooking. [Abstracter: F. T. Piskur]

6.54 FISH FLOUR

British Patent 1,155,047
Salomon, A. (pat.)
Food Technology 23, No. 12, 69 (December 1969)

Oxygen generating chemicals, such as sodium perborate, are mixed with the raw fish before they are dried and pulverized. The final fish product is said to be bacteria free and to have improved flavor and odor.
[Abstracter: F. T. Piskur]

6.54 FISH PRODUCT

British Patent 1,163,223
White Fish Authority and Herring Industry Board (pat.)
B.F.M.I.R.A. 22, No. 11, Item 2217, 566 (November 1969)

A fish product, with the consistency of sausage meat or luncheon meat, made from chopped herring, kipper and pork fat mixed with a cereal binder such as farina, is described. [Reprinted]

6.54 PROTEIN FOOD SUPPLEMENTS 1969
(9.6)(0.6)

Noyes, Robert
Food Processing Review No. 3, 412 pp. (n.d.) $35
Noyes Data Corporation, Noyes Building, Park Ridge, New Jersey 07656

The eight chapters in this book cover 126 processes for producing protein by hydrocarbons, textured foods that simulate meat, and proteins from a variety of sources. One chapter is entitled "Fish-Based Protein." The book is based on the patent literature and is indexed by company, inventor, and patent number.
[Abstracter: L. Baldwin]

9.16 SEWAGE PURIFICATION BY PHOTOSYNTHETIC BACTERIA AND ITS USE AS A FISH-FEED (9.14)

Kobayashi, Michiharu (Department of Agricultural Chemistry, University of Kyoto, Kyoto, Japan), Atsuo Kawamura, Shotaro Oya, Kyoji Mikami, Hiroshi Nakanishi, Kiyomi Murata, Yoshihiro Kinugasa, and Tadaaki Kawasugi
Bulletin of the Japanese Society of Scientific Fisheries 35, No. 10, 1021-1026 (October 1969) (In Japanese; figures, tables, and summary in English)

Photosynthetic bacteria are important in the purification of sewage. In the present work, excrement from domestic fowl was treated with photosynthetic bacteria and the resulting solution was added to ponds containing young Crucian carp. The young fish grew well in such ponds, and if appropriate amounts of the treated solution were added to the ponds, the survival rate of the young carp was greater than that of fish grown in untreated control ponds. The photosynthetic bacteria Rhodopseudomonas capsulatus contain 59.9 percent protein, 7.91 percent crude fat, 20.83 percent soluble carbohydrate, 2.92 percent crude fiber, 4.40 percent ash, and 200 γ/100 g. vitamin B12.
[3 figures, 5 tables, 18 references] [Abstracter: F. T. Piskur]

9.17 THE CONCERN FOR CONSERVATION IN THE UNITED STATES
DEPARTMENT OF THE INTERIOR, WASHINGTON, D.C.

Anonymous
U.S. Government Research and Development Reports, U.S. Department of Commerce, Clearinghouse for Federal Scientific and Technical Information 69, No. 22, 18 (November 25, 1969)
Available from the Clearinghouse for Federal Scientific and Technical Information, U.S. Department of Commerce, Springfield, Virginia 22151. Document No. PB-185-940. Price $3.00.

The report is a bibliography of selected literature on the history of conservation in the United States. It concentrates on the organizations, institutions, events, and individuals prominently associated with the issues of conservation. The published literature cited covers the period of from 1900 to date.
[Abstracter: F. T. Piskur]

9.17 hypotheses, projections of experience); (2) data must be translated in terms of interests requiring or deserving protection or development; (3) priorities must be developed among these interests according to their relative importance; (4) alternatives among goals with comparable priority ratings must be developed; (5) methods and means of solving problems must be evaluated as to their relative effectiveness; (6) costs must be set within an acceptable benefit-cost ratio. Each of these elements are governed by (1) a unifying philosophy that is a system of values that represents the element of strategy--the major characteristic of this philosophy should be the broadening of the predominantly economic approach to social policy, planning, and management; and (2) the need for predictability and flexibility that represents the element of tactics. The proposed policy-making process represents the ordering of empirical data with the help of philosophical principles and value judgments, and their translation into a set of goals that can be expressed in comprehensive or partial plans executed through legislation and administration. [31 references]

9.19 WATER QUALITY AND AGING OF STRIP-MINE LAKES

Campbell, Robert S. (University of Missouri, Columbus) and Owen T. Lind (Baylor University, Waco, Texas)
Journal of the Water Pollution Control Federation 41, No. 11, Part 1, 1943-1955 (November 1969)

The paper reports on the physical and chemical characteristics of five different strip-mine lakes during the aging process. Strip-mine lakes differ from natural lakes. The initial successional stage is acid rather than oligotrophic, and is characterized by low pH, high potential acidity, absence of bicarbonate, and large concentrations of dissolved minerals. The sulfate ion is the predominate anion. The characteristic colors are strong intensities of red, blue, or green. The physical and chemical aging of strip-mine lakes is delayed by continuous sulfuric acid pollution. The lakes are homeothermous during the less acid phase. An alkaline stage appears later that is comparable to stages of early eutrophy in natural lakes.
[4 figures, 10 tables, 23 references] [Abstracter: F. T. Piskur]

9.19 AIR POLLUTION, PROCEEDINGS OF THE FIRST EUROPEAN CONGRESS ON THE INFLUENCE OF AIR POLLUTION ON PLANTS AND ANIMALS

Anonymous
Centre for Agricultural Publishing and Documentation, 415 pp. (n.d.), Dfl. 42.50
Kenneth Mellanby (reviewer)
New Scientist 44, No. 679, 567-568 (December 11, 1969)

This publication contains some 36 papers read at a congress sponsored by the Netherlands Government and the Council of Europe and organized by the Agricultural University, Wageningen [Netherlands]. Among the pollutants that contribute to the biological effects of air pollution, fluorine, photochemical smog, sulfur dioxide, and some less frequently encountered pollutants were discussed. As a rule, once the cause of pollution damage has been identified, a means of control can be devised. Whether it can be enforced, however, is another problem, for since many instances of pollution damage in one country are the result of emissions in another, successful control depends on international cooperation. Thus control becomes essentially political.

 Abstracter: L. Baldwin

9.2 THREE COUNTRIES OWN HALF WORLD'S FISHING SHIPS
(1.01)

Anonymous
Fishing News, No. 2946, 3 (November 21, 1969)

Lloyd's Register of Shipping Statistical Tables for 1969 shows 52,276 vessels in the world's merchant fleet. Of these, 11,535 are engaged in trawling or some other form of commercial fishing; 414 are fish carriers or factory ships. Of the 87 countries owning trawlers and other fishing vessels larger than 100 gross tons, three--the Soviet Union, Japan, and Spain--own more than half the vessels and account for over two-thirds the total tonnage.

The Soviet Union is by far the leading owner of the larger fishing vessels. She has 2,604 trawlers and other catchers (382 being over 2,000 tons) and 304 carriers and factory ships (66 being over 10,000 tons and 80 being between 4,000 and 10,000 tons). These ships account for 3,405,148 tons, almost half the world's total.

On the back of the card is a list of countries that rank immediately below the Soviet Union in ownership of fishing vessels larger than 100 tons.

(over)

 Abstracter: L. Baldwin

9.2 FORECASTING WORLD DEMAND FOR TUNA TO THE YEAR 1990
(1.12)

Bell, Frederick W. (Division of Economic Research, U.S. Bureau of Commercial Fisheries)
Commercial Fisheries Review 31, No. 12, 24-31 (December 1969) (Separate No. 856)

Total world demand for tuna continues to increase rapidly due to rising populations and expanding per-capita income in the principal tuna-consuming countries, such as the U.S., Japan, and members of the European Economic Community (EEC). EEC comprises Belgium, Luxembourg, France, West Germany and the Netherlands.

Taking into account expected increases in population and standard of living (per-capita income) over the next 20 years, we have forecast that world tuna consumption would approach 5 million metric tons by 1990 if supplies were available. However, this is not possible because maximum sustainable yield of known tuna resources in the world is estimated to be no more than 2.6 million metric tons.

To match consumption with available supplies, it is likely that prices of tuna will increase appreciably in the next 20 years. The increasing pressure of demand makes it especially necessary to consider sound management schemes to reduce the possibility of overfishing and destroying the world's tuna resources. [2 figures, 4 tables]

 Author's abstract

9.3 THE UNITED NATIONS AND THE BED OF THE SEA
(9.11)
Eichelberger, Clark M. (Commission to Study the Organization of Peace)
San Diego Law Review 6, No. 3, 339-353 (July 1969)

The author reviews the various discussions in the United Nations and elsewhere concerning the bed of the sea. Economically, the sea bed is much more important than space exploration for mankind because it contains valuable resources that are now attainable. The Commission to Study the Organization of Peace formulated the following comprehensive principles regarding the bed of the sea:

"1. The seabed and ocean floor, and the subsoil thereof, which underlie the high seas and which underlie beyond the generally recognized limits of national jurisdiction, are the common heritage of mankind.

2. A precise boundary for this area should be defined with all possible speed....

3. The resources of this area should be developed for the benefit and in the interest of all mankind, taking into account the special needs of the developing States....

4. No State should be permitted to claim or exercise sovereignty, jurisdiction or any exclusive rights over this area, and no part of this area should be subject to national appropriation by any means whatsoever.

5. This area should be open to scientific investigation, without discrimination, and international scientific cooperation and technical assistance should be fostered by the United Nations, as well as its specialized agencies and the International Atomic Energy Agency, so as to enable all States to participate in such investigations and to have access to their results.

 Abstracter: F. T. Piskur

9.2 JAPANESE SHIPBUILDING PRACTICES
(2.11) (1.0154)

McQuade, John and K. K. Christensen (National Steel and Shipbuilding Co., San Diego, California)
Marine Technology 6, No. 4, 418 (October 1969)

This paper reports on the many aspects of Japanese shipbuilding (historical development, organization, research, employment practices, salaries, engineering, planning, scheduling, production techniques, facilities and equipment, and welding procedures). Japan is the leading shipbuilding nation in the world today and has earned this position by a well-conceived plan. Universities, government, and industry joined in a united effort to: develop new technologies; train naval architects and engineers; develop new methods to speed construction; build allied industries to develop engines, deck equipment, etc., to support shipbuilding; develop designs for large vessels; develop new shipyards employing new technology; provide financing to make it easier for the shipbuilder to build and the operator to buy the vessels; develop concise schedules for shipyard and supporting industries to construct quality ships at reasonable prices and on schedule.
[17 figures, 7 tables, 12 references] [Abstracter: F. T. Piskur]

9.3

6. All activities in this area should be conducted in accordance with the Charter of the United Nations, hitherto accepted principles of international law, and this Declaration, and should not cause any unjustifiable interference with the freedom of the high seas.

7. All activities in this area should conform to guidelines aimed at protecting the rightful interests of all States and at minimizing harmful effects....

8. The seabed, and subsoil thereof, should be used for peaceful purposes only....

9. The United Nations, in cooperation with its specialized agencies and the International Atomic Energy Agency, should take adequate measures to ensure the observance of these principles.

10. The orderly utilization of the resources of the seabed, and subsoil thereof, requires an appropriate international regime, established by the United Nations...." [19 references]

9.3 APROPOS THE 1968 SOVIET MARITIME CODE

Butler, William E. (Harvard Law School) and John B. Quigley, Jr. (Ohio State University College of Law, Columbus)
San Diego Law Review 6, No. 3, 412-427 (July 1969)

The Presidium of the Supreme Soviet of the U.S.S.R. confirmed a new Merchant Shipping Code that entered in force October 1, 1968. The code regulates relations of merchant shipping including vessels used for fishing, sealing, whaling, and any other economic, scientific, and cultural purposes. The authors state that the new code has brought Soviet legislation still closer to conformity with the law and practice of noncommunist states while preserving certain socialist features.
[20 references] [Abstracter: F. T. Piskur]

9.19 THE BIOLOGICAL ASPECTS OF WATER POLLUTION
(9.6)

Wilber, Charles G.
Charles C. Thomas Publisher, 301-27 East Lawrence Avenue, Springfield, Illinois 62703, 298 pp. (n.d.) $23.75
Kenneth Mellanby (reviewer)
New Scientist 44, No. 679, 567-568 (December 11, 1969)

This book, based mainly on work done in North America, is a useful, technical account of the occurrence of all the major pollutants and of the ecological effects of water pollution. The author states that it was written for administrators, among others. The reviewer states that its value to scientists should be considerable. [Abstracter: L. Baldwin]

9.6 SHIP HULLS MADE OF REINFORCED CONCRETE: DESIGN, STRENGTH, (2.117) (1.0145) AND CONSTRUCTION TECHNOLOGY

Bezuklador, V. F., K. K. Amel'yanovich, V. D. Verbitskiy, and L. P. Bogoyavlenskiy
Published by Shipbuilding Publishing House, Leningrad, U.S.S.R. (1968) (In Russian)
Navships Translation No. 1148, 229 pp. (November 1968) (Translated by Lloyd G. Robbins, Scientific Documentation Division (205), Naval Ship Systems Command, Department of the Navy, Washington, D.C. 20360)
Reviewed by John Gardner
National Fisherman 50, No. 9, 8-C (January 1970)

The book describes Soviet experience with ferro-cement vessels.
[Abstracter: F. T. Piskur]

9.2

Rank	Country	Number of vessels over 100 tons		Total tonnage
		Total	Over 2,000 tons	
2	Japan	2,125	44	888,471
	(trawlers/catchers)	2,067		719,097
	(carriers/factory)	58		169,374
3	Spain	1,290	9	409,168
	(trawlers/catchers)	1,289		398,755
	(carriers/factory)	1		10,413
4	United Kingdom	578	2	240,212
5	France	663		192,876
6	Norway	623		178,156
7	Poland	168	34	176,275
8	West Germany	215		161,886
9	Canada	458		124,134
10	East Germany	161		107,111
11	Portugal	154		105,523
12	Italy	158		71,617
13	Iceland	228		62,310

0.116 (7.0) DESIGN AND TESTING OF SOME AUTOMATIC SAMPLE INTRODUCTION VALVES FOR LIQUID CHROMATOGRAPHS

Peterson, John I., Frank Wagner, Frank Anderson, and George M. Thomas, Jr. (Biochemical Engineering and Instrumentation Branch, Division of Research Services, National Institutes of Health, U.S. Department of Health, Education, and Welfare, Bethesda, Maryland 20014)
Analytical Biochemistry 32, No. 1, 128-137 (October 15, 1969)

The authors tested the performance of three types of automatic sample introduction valves for liquid chromatographs. The performance of the valves was compared with that achieved by manual loading of the sample on the column. Two of the valves were of the rotary sliding chamber type, one a short chamber version and the other a long chamber version. The third valve was a commercial sample loop type. The purpose of the test was to provide a basis for the construction of an automated sample introduction system.

The comparisons were made on an ion-exchange amino-acid analyzer. The performance was evaluated by the technique of resolution measurement used in gas chromatography. The authors found that the performance of each of the valves was equivalent to and closely approached the resolution obtained by manual sample loading. [6 figures, 1 table, 4 references] [Abstracter: F. T. Piskur]

3.30 ESTIMATING THE CENTRAL TEMPERATURES OF CANNED FOOD DURING THE INITIAL HEATING OR COOLING PERIOD OF HEAT PROCESS

Hayakawa, Kan-ichi (Food Science Department, Rutgers, The State University, New Brunswick, New Jersey)
Food Technology 23, No. 11, 141-145 (November 1969)

The author discusses a procedure for estimating the heating and cooling curves at the center of canned foods by applying the formulas for heat conduction. A series of temperature response charts for finite cylinders was prepared using a digital computer in order to facilitate the estimation. The curvilinear and the linear portions of the heating and the cooling curves can be easily estimated by the procedure. [5 figures, 2 tables, 27 references]
[Abstracter: F. T. Piskur]

3.335 PROTEINACEOUS FOOD SALAD
(3.235)
U.S. Patent 3,454,405
Beach, P. L.; Proteus Foods & Industries, Inc. (pat.)
Food Technology 23, No. 11, 82 (November 1969)
Salads of meat, fish, certain vegetables, and dressing can be frozen or canned. The dressing contains microcrystalline cellulose, vegetable oil, artificial sweetner, vegetable gum, and an emulsifier. [Abstracter: F. T. Piskur]

0.34 (7.83) HYDROGEN SULFIDE, A DIRECT AND POTENTIALLY INDIRECT CONTRIBUTOR TO COOKED CHICKEN AROMA

Pippen, E. L., and E. P. Mecchi (U.S. Department of Agriculture, Research and Development Division, ARS, Albany, California 94710)
Journal of Food Science 34, No. 5, 443-446 (September-October 1969)

Using a model system, the authors found that chicken fat, after being treated with acetaldehyde and H_2S and then purged free of these reagents, exhibited a new aroma and acquired a fixed sulfur content. Apparently a reaction between H_2S and acetaldehyde took place in the fat. Such reactions between H_2S and carbonyls in fat could be quite general. Thus, H_2S may contribute to the cooked chicken flavor and aroma through the formation of such secondary products.
[3 figures, 6 tables, 10 references] [Abstracter: F. T. Piskur]

0.6 FLAVOR ENHANCEMENT
Japanese Patent 10154/69
Asahi Chem. Ind. Co. (pat.)
Food Technology 23, No. 11, 79 (November 1969)
Calcium 5'-inosinate and calcium 5'-guanylate are used to enhance the flavor of foods containing phosphatase. [Abstracter: F. T. Piskur]

4.14 NATURALLY OCCURRING DIOL LIPIDS DIALKOXYPENTANES IN PORPOISE (PHOCOENA PHOCOENA) JAW OIL

Varanasi, Usha, and Donald C. Malins (Food Science Pioneer Research Laboratory, U.S. Bureau of Commercial Fisheries, Seattle, Washington 98102)
Science 166, No. 3909, 1158-1159 (November 28, 1969)

This paper reports on the isolation and characterization of dialkoxypentanes from the jaw lipid of the porpoise Phocoena phoceoena. This is the first report of the isolation of the diol lipids in intact form. The dialkoxypentanes consisted primarily of those having two 18-carbon chains. The roles played by the diol lipids in the life processes have not been established. The authors suggest that the isolation of the dialkoxypentanes from the porpoise offers a unique opportunity for further studies on the role of the alkoxy chain in the metabolism of diol lipids. [1 figure, 8 references] [Abstracter: F. T. Piskur]

4.7 REFINING OF GLYCERIDE OILS
U.S. Patent 3,455,975
Martinenghi, G. B. (pat.)
Food Technology 23, No. 11, 80 (November 1969)
Volatile materials in glyceride oils are entrained by passing steam through the oils at high temperature and low pressure. [Abstracter: F. T. Piskur]

0.119 EXPERIMENTAL SEA-WATER AQUARIUM

Lasker, Reuben, and Lillian L. Vlymen (U.S. Bureau of Commercial Fisheries Fishery-Oceanography Center, La Jolla, California)
U.S. Fish and Wildlife Service, Circular 334, 14 pp. (November 1969)

Among the facilities at the Bureau of Commercial Fisheries' Fishery-Oceanography Center at La Jolla is a 9,300 sq. ft. sea-water aquarium. This experimental facility, which has been in operation since 1965, has a number of features not usually incorporated in sea-water aquaria. In this paper, detailed information about the innovations in equipment, design, and operation that have made the aquarium so suitable for fishery and marine biological research is given. Covered are the sea-water supply, equipment for treating and delivering the sea water, special facilities (water tables, adjacent work benches, and fish tanks), pneumatic temperature regulators, controlled environment rooms, experiment cubicles, and maintenance. [16 figures, 13 references] [Abstracter: L. Baldwin]

0.116 IMPROVED APPARATUS FOR MANUAL COUNTERCURRENT DISTRIBUTION (7.0)

Bush, Milton T., and Otto W. Post (Department of Pharmacology, Vanderbilt Univ., School of Medicine, Nashville, Tenn. 37203; H. O. Post Scientific Instrument Co., Inc., 69-57 Juniper Boulevard South, Middle Village, New York 11379)
Analytical Biochemistry 32, No. 1, 145-149 (October 15, 1969)

This report describes an improved and inexpensive glass decantation tube and a stainless-steel bracket for mounting and handling trains of small numbers of such tubes for countercurrent distribution.

[3 figures, 9 references] [Abstracter: F. T. Piskur]

0.6 PROTEIN FROM WOOL

Shorland, F. B. (DSIR Food Chemistry Division, Wellington, New Zealand)
Food Manufacture 44, No. 10, 42-45 (October 1969)

This paper discusses the use as a food ingredient of digestible protein prepared by the enzymic or chemical treatment of wool. The amino-acid composition of wool protein (in g./100 g.) is: arginine, 9.8; histidine, 1.2; isoleucine, 3.7; leucine, 8.9; lysine, 3.3; methionine, 0.56; phenylalanine, 4.0; threonine, 6.5; tryptophan, 0.94; and valine, 5.7. Wool protein is generally deficient in methionine and to a certain extent in lysine and tryptophan.

[1 table, 39 references] [Abstracter: F. T. Piskur]

3.63 DRIED FISH PRODUCTS

Japanese Patent 12716/69
Jintan Shokuhin K.K. (pat.)
Food Technology 23, No. 11, 82 (November 1969)

The process proposed in Japanese Patent 12715 (use of dehydroascorbic acid or dehydroisoascorbic acid to stabilize meat or fish pastes) is adapted to the drying of fish and shellfish. [Abstracter: F. T. Piskur]

3.231 FREEZING APPARATUS

Canadian Patent 815,243
Ross, J. W.; Union Carbide Canada Ltd. (pat.)
Food Technology 23, No. 11, 90 (November 1969)

The foodstuff is precooled by contact with the vapor of the liquid refrigerant gas. Thin layers of liquid refrigerant gas form on the surface of the food and then evaporates. [Abstracter: F. T. Piskur]

3.2383 FREEZING PACKED FOODSTUFFS

British Patent 1,153,288
Wenting, H. W. (Renver, Holland) (pat.)
Modern Refrigeration and Air Conditioning 72, No. 858, 87 (September 1969)

When packaged foodstuffs are frozen in a container, the package often adheres strongly to the wall of the container. Under such conditions the wall must be heated before the packs can be removed. The problem was solved by the development and use of a container having two or more sides hinged so that the entire container can be opened up. [Abstracter: F. T. Piskur]

9.10 STUDIES ON THE BLOOD SERUM OF THE EURYHALINE CYPRINODONT FISH, FUNDULUS HETEROCLITUS, ADAPTED TO FRESH OR TO SALT WATER

Pickford, Grace E., F. Blake Grant, and Bruce L. Umminger (The Bingham Laboratory, Department of Biology, Yale University, New Haven, Connecticut 06520)
Transactions of the Connecticut Academy of Arts and Sciences 43, 25-70 (October 1969) (Archon Books, The Shoe String Press, Inc., 995 Sherman Avenue, Hamden, Conn. 06514)

This study was initiated by the senior author when it became evident that fresh-water adaptation in Fundulus heteroclitus was dependent upon the presence of the pituitary (Burden, 1956). Failure of hypophysectomized F. heteroclitus to survive in fresh water was correlated with an inability of the fish to maintain normal levels of serum chloride. The present authors carried out a more complete study of the normal constituents of the serum in intact fish adapted to either salt water or fresh water. All tests were made on parallel groups of fish adapted to salt water or fresh water under otherwise similar laboratory conditions. In most of the tests, sufficient serum was pooled from 2 to 5 fish to permit at least 8 different constituents to be measured on the same sample. The physicochemical properties (serum osmolality, blood pH, and plasma specific gravity), serum ions (Na^+, K^+, Ca^{++}, Mg^{++}, Cl^-, PO_4^{--} and HCO_3^-), and serum organic constituents (glucose, nonglucose carbohydrate, urea, total amino acids, total nonprotein-nitrogen, total proteins and electrophoretic fractions, total cholesterol, total phosphate, and estimated phospholipid) were studied in samples of the blood of the parallel groups of salt water--or fresh water--adapted male F. heteroclitus maintained under constant laboratory conditions (20° C., 8 hours per day of light, daily feeding). The results revealed little or no differences in the composition of the serum of the fish that could be related to sexual maturation, although there was a slight trend to lower serum osmolality. [8 tables, 174 references]

[Abstracter: F. T. Piskur]

ACTA BIOCHIMICA POLONICA, Polish Academy of Sciences, Committee of Biochemistry & Biophysics, Krakowskie Przedmieście 26/28, Warsaw 64, Poland

ACTA HYDROBIOLOGICA, Zakład Biologii Wód, Polska Akademia Nauk, ul. Sławkowska 17, Kraków, Poland

ACTA HYDROPHYSICA, Akademie-Verlag GmbH., 108 Berlin, Leipzigerstrasse 3-4, West Germany

ACTA PATHOLOGICA ET MICROBIOLOGICA SCANDINAVICA, Munksgaard, 47 Prags Boulevard, DK-2300 Copenhagen S, Denmark

ACTA PHARMACOLOGICA ET TOXICOLOGICA, Munksgaard, Nørregade 6, Copenhagen K, Denmark

ACTA PHYSIOLOGICA SCANDINAVICA, Karolinska Institutet, 104 01 Stockholm, Sweden

ADVANCED WASTE TREATMENT RESEARCH PUBLICATIONS, U.S. Department of Health, Education & Welfare, Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio 45226

ADVANCES IN ENZYMOLOGY AND RELATED AREAS OF MOLECULAR BIOLOGY, Interscience Publishers, John Wiley & Sons, Inc., New York, N.Y.

ADVANCES IN MARINE BIOLOGY, Academic Press Inc., 111 Fifth Avenue, New York, N.Y. 10003

ADVANCES IN PROTEIN CHEMISTRY (same as Advances in Marine Biology)

AGRICULTURAL AND BIOLOGICAL CHEMISTRY, Agricultural Chemical Society of Japan, c/o Department of Agricultural Chemistry, Faculty of Agriculture, University of Tokyo, Bunkyo-ku, Tokyo, Japan

AIChE JOURNAL, American Institute of Chemical Engineers, 345 East 47th Street, New York, N.Y. 10017

AMERICAN ECONOMIC REVIEW, American Economic Association, George Banta Co., Inc., Menasha, Wis. 54952

AMERICAN FISHES AND U.S. TROUT NEWS, 67 West 9000 South, Sandy, Utah 84070

AMERICAN JOURNAL OF CLINICAL NUTRITION, 9650 Rockville Pike, Bethesda, Md. 20014

AMERICAN JOURNAL OF DIGESTIVE DISEASES, Hoeber Medical Division, Harper & Row, Publishers, Inc., 49 East 33rd Street, New York, N.Y. 10016

AMERICAN JOURNAL OF EPIDEMIOLOGY, The Williams & Wilkins Co., 428 East Preston Street, Baltimore, Md. 21202

AMERICAN JOURNAL OF PHYSIOLOGY (same as American Journal of Clinical Nutrition)

AMERICAN JOURNAL OF PUBLIC HEALTH, American Public Health Association Inc., 1740 Broadway, New York, N.Y. 10019

AMERICAN JOURNAL OF TROPICAL MEDICINF AND HYGIENE, Allen Press, Inc., 1041 New Hampshire Street, Lawrence, Kans. 66044

AMERICAN SCIENTIST, Sigma Xi, 155 Whitney Avenue, New Haven, Conn. 06510

ANALYST, Society for Analytical Chemistry, 9/10 Savile Row, London, W1X 1AF, England

ANALYTICA CHIMICA ACTA, Elsevier Publishing Co., P.O. Box 211, Amsterdam, The Netherlands

ANALYTICAL ABSTRACTS (same as Analyst)

ANALYTICAL BIOCHEMISTRY (same as Advances in Marine Biology)

ANALYTICAL CHEMISTRY, American Chemical Society, 1155 Sixteenth Street N.W., Washington, D.C. 20036

ANGEWANDTE CHEMIE (International Edition) (same as Advances in Marine Biology)

ANNALES DE L'INSTITUT PASTEUR, Masson et Cie., Éditeurs, Libraires de l'Académie de Medécine, 120, Boulevard Saint-Germain, Paris, VIe, France

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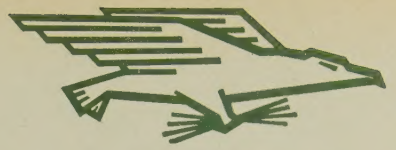
USE OF FUNDS FOR PRINTING THE ABSTRACTS WAS APPROVED BY THE DIRECTOR OF THE BUREAU OF THE BUDGET, APRIL 18, 1968

GPO 996-920

UNITED STATES
DEPARTMENT OF THE INTERIOR
U.S. FISH AND WIDLIFE SERVICE
BUREAU OF COMMERCIAL FISHERIES
DIVISION OF PUBLICATIONS
BLDG. 67, U.S. NAVAL AIR STATION
SEATTLE, WASHINGTON 98115

OFFICIAL BUSINESS



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